New Vanguard

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Cadillac Gage V-100 Commando 1960–71

Lathrop & J McDonald • Illustrated by J Laurier

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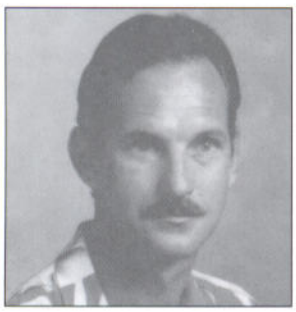

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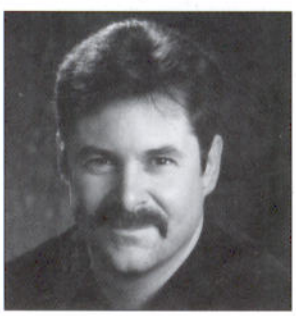

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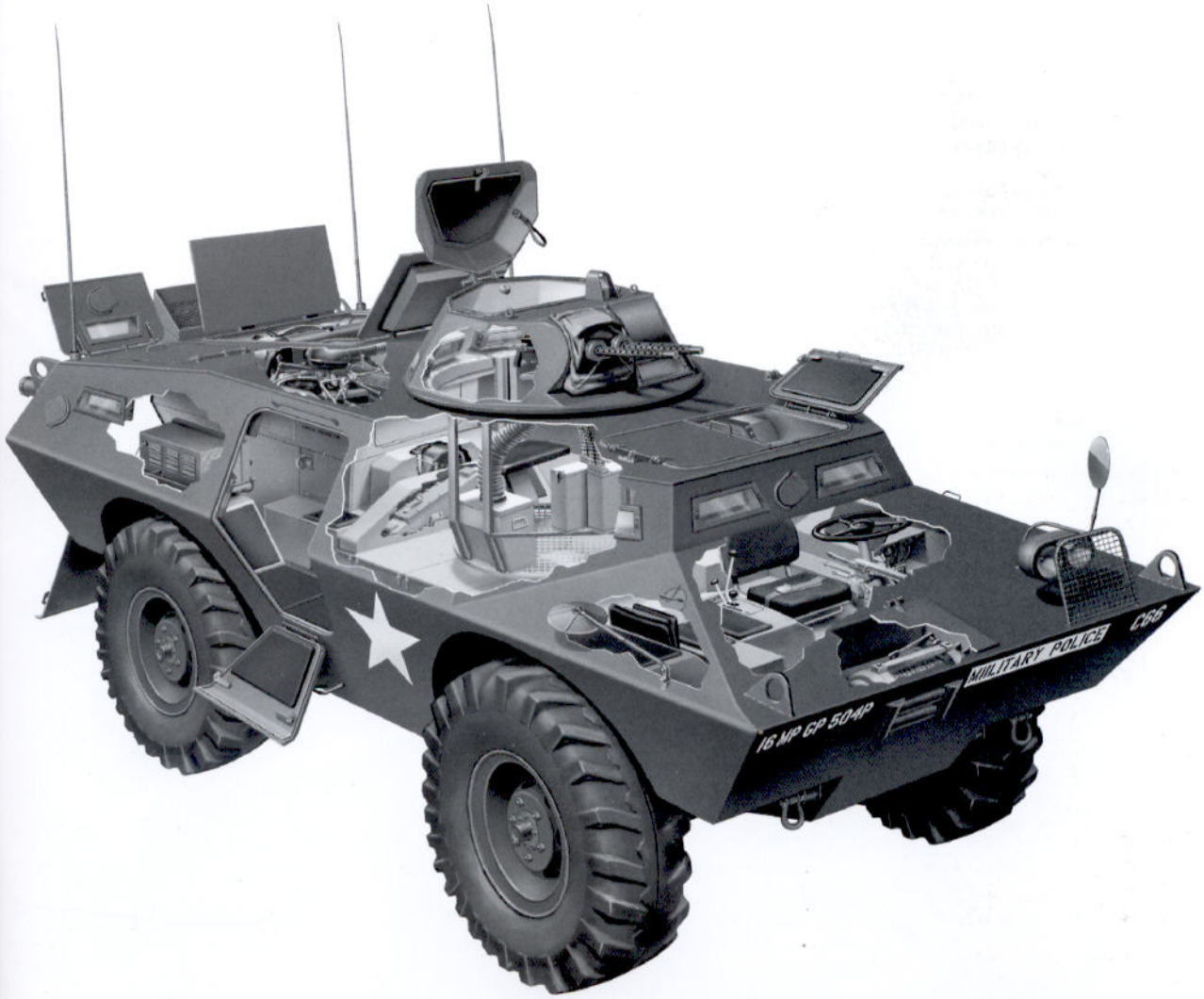

R Lathrop & J McDonald • Illustrated by J Laurier

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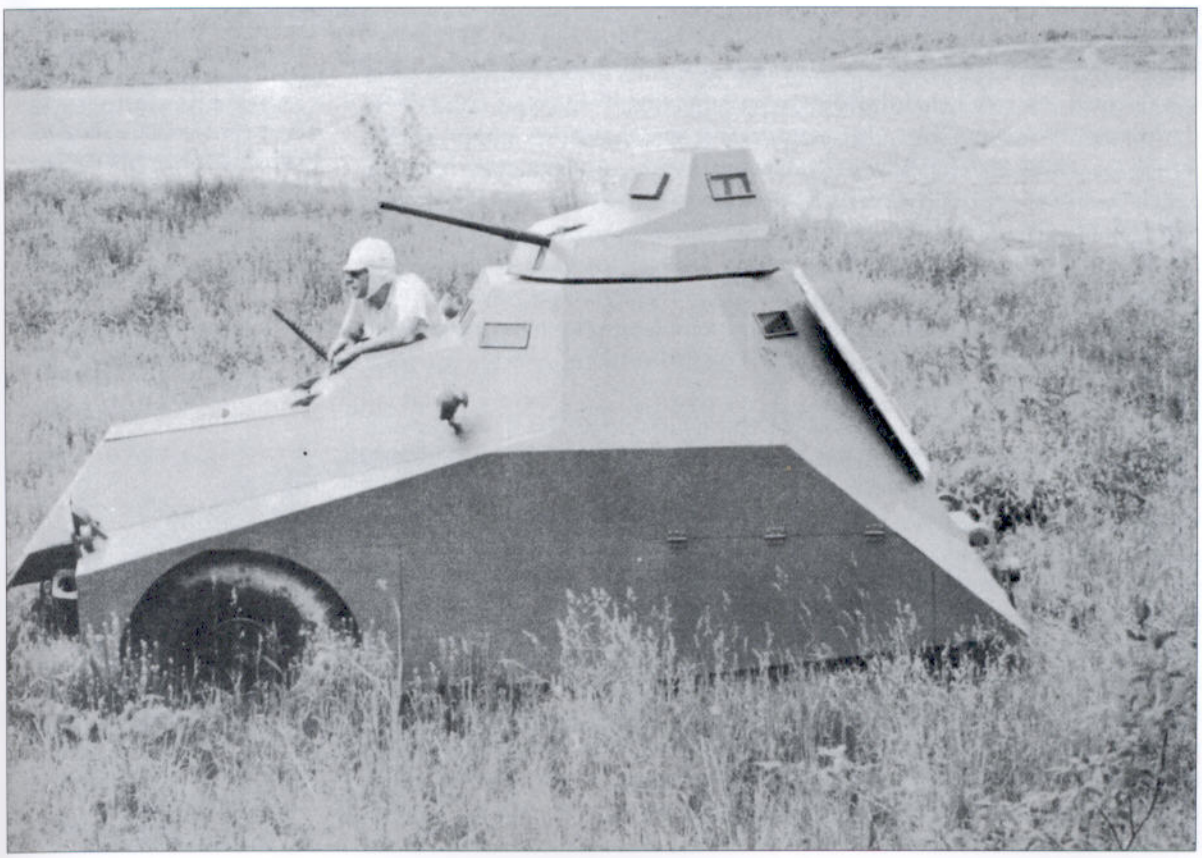
CADILLAC GAGE V-100 COMMANDO 1960–71

RESEARCH AND DEVELOPMENT

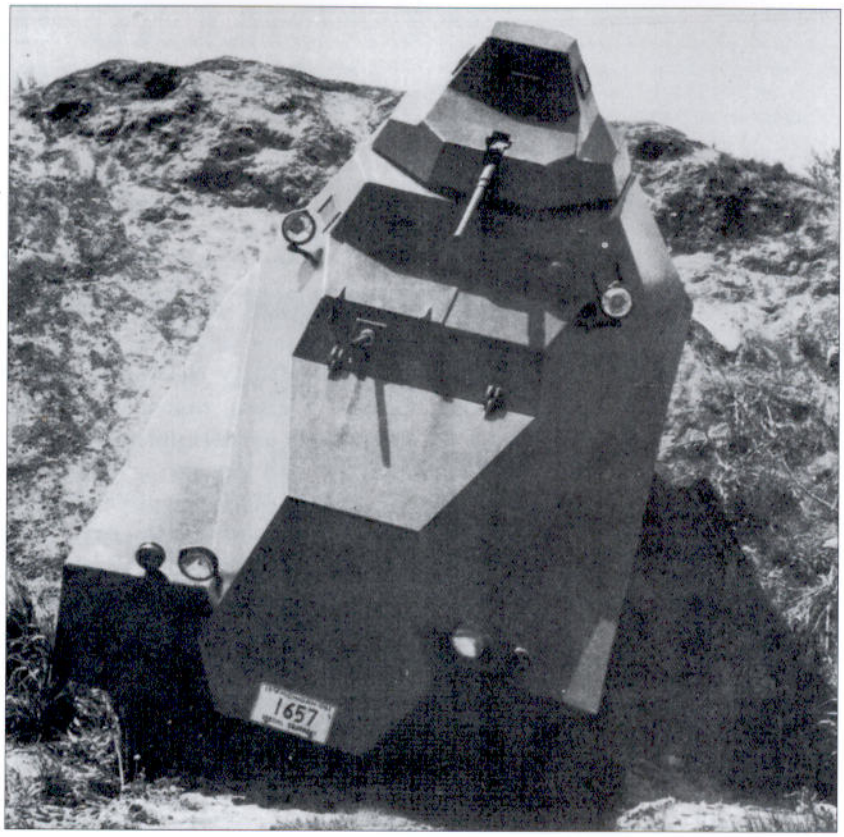
The Cadillac Gage Company, located in the Detroit, Michigan, area of the United States, was founded in 1941 and originally specialized in manufacturing measuring equipment. By the 1950s Cadillac Gage had become a leader in the design and manufacture of hydraulic components for the infant US space program and for the turret of the M48 tank. By the early 1960s the company had grown into a multifaceted conglomerate, comprising several divisions. One of those divisions, the Terra-Space Corporation, decided to expand into developing and producing combat vehicles.

Terra-Space's first attempt at combat vehicle development was called the Peacemaker. Based on a Dodge truck power-train and frame, the vehicle had a sloped, armored body and turret, which was reminiscent of the prewar German armored cars. However, the vehicle lacked the one-



Side view of the original Terra-Space armored car. The Peacemaker was based on a Dodge W-300 chassis and was armed with two machine guns. However, the design lacked fording capabilities and growth potential. (Copyright Cadillac Gage Textron Inc.)

piece hull of a conventional tank and was unable to ford anything larger then a small stream. Another drawback of the design was that it was impossible to accommodate larger weapon stations on the Peacemaker. Terra-Space had, nevertheless, gained useful experience in combat vehicle design, and the Peacemaker had prompted valuable feedback from potential customers. It is interesting to note that Chrysler, the company in charge of the US Tank Plant, was located just down the road from Cadillac Gage and was developing its own light-armored vehicle at the time.

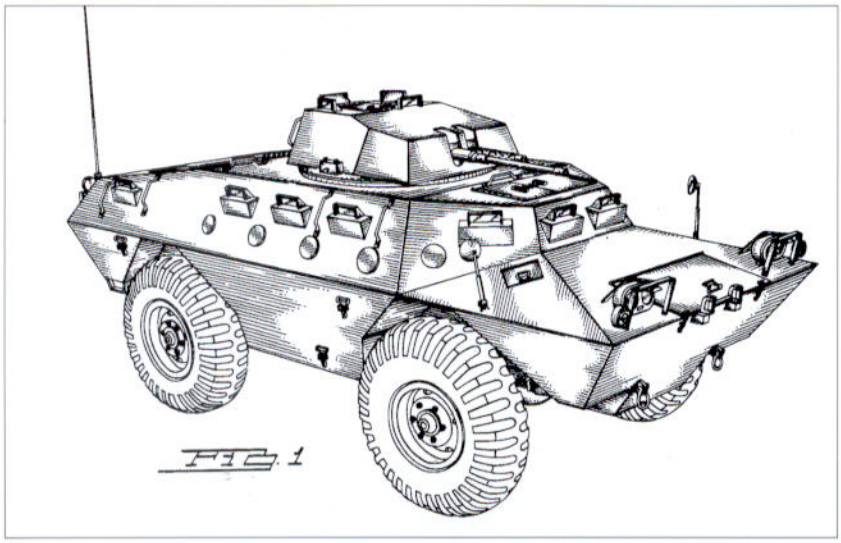


Frontal view of the Peacemaker; a combat vehicle that never made it beyond the prototype stage. Michigan special equipment tags on the front of the vehicle date this photograph to 1961. (Copyright Cadillac Gage Textron Inc.)

In 1962 Terra-Space's engineers went back to the drawing board to begin work on their second concept design. By late 1962 work had progressed sufficiently far that a US design patent for the new vehicle – the Commando – was applied for and received.

As stated in the early Commando Brochures, the goal of the designers was to develop a "multi-purpose, inexpensive armored vehicle, which could be utilized in virtually all areas of the world and under any climatic condition." To achieve this goal the Commando was a simply constructed 4x4 armored vehicle, with a rear-mounted engine that utilized common, heavy-duty, commercial and military components. The Commando was designed to function as a personnel carrier, a convoy escort vehicle, reconnaissance car, riot control vehicle, and for use as a patrol and police vehicle.

The hull of the Commando was comprised of several flat homogenous armored plates, and it was angled to provide additional protection from small arms fire. There were several advantages to be gained from angling the armored plates that made up the Commando's hull. Angling armored plate allowed the vehicle to use less armor to achieve the same level of protection as traditional vertical plates, which meant the vehicle weighed less and increased its operating range and carrying capacity. The Commando's hull design also increased the possibility of ricochets from small arms fire and shrapnel, reducing the chance of penetration. Finally, by angling the lower-hull plates into a V-shape, there was less flat surface area for the force from any detonation of explosives underneath the hull to act against. As a result, the force of any blast would be directed upwards and away from the vehicle and the crew, thereby increasing the chances of surviving such an attack.



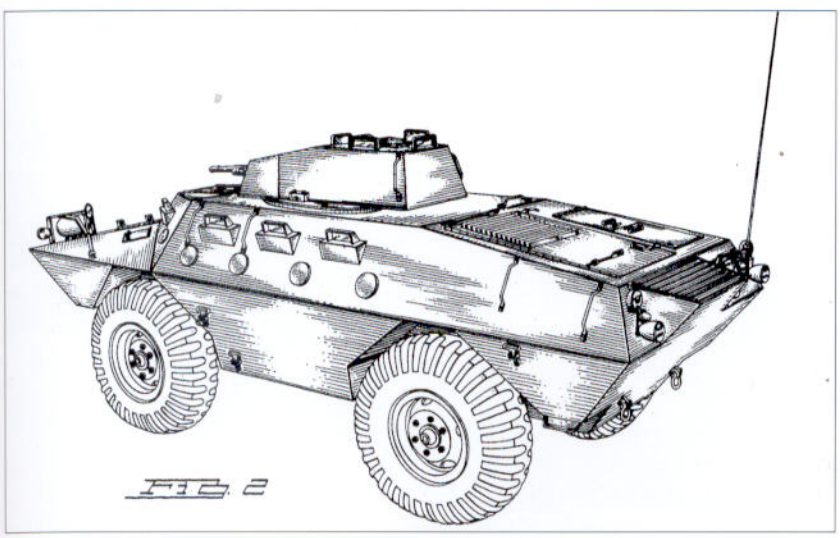
ABOVE **Design patent side drawings of the prototype V-100. The vehicle shown is a completely new design and a radical departure from the Peacemaker. Note that the prototype lacks side hatches of any type and all access is from top hatches.**

BELOW **Rear view of the V-100 from the original design patent. The illustration shows the top engine-access hatches, which remained mostly unchanged, and the radio operator's hatch, which was changed to a single door. The prototypes did not have a rear hatch or side hatches at this point.**

The armor plate used on the Commando was developed by Cadillac Gage and was called Cadaloy. It was an armor of high strength, measuring 500 on the Brinell scale. As a means of comparison, common or mild steel used in automobiles measures about 30 on the same scale. However, the trade-off of Cadaloy's strength was its susceptibility to cracking due to external stresses. The armored hull could withstand .30-caliber ball ammunition at zero degree obliquity and .50-caliber ammunition at 45 degrees obliquity. The same resistance in mild steel would require a plate over one inch thick or more. The Commando's strong but thin armor enabled the vehicle to tip the scales, when fully combat loaded, at 14,800lb.

The original Commando design utilized 11 periscopes of the same type used on the US Army's M113 series armored personnel carrier. Firing ports located around the vehicle and underneath the periscopes allowed the occupants to fire, under the protection of armor, from within the vehicle. However, the periscopes lacked the maximum amount of ballistic protection, and they were soon replaced with angled glass ports or vision blocks. These vision blocks were 3 in. thick and made of 13 layers of glass, which were laminated together and encased in a metal frame; a development learned from the M114's 20mm cupola that Cadillac Gage was also working on at the time.

For entrance and exit from the vehicle, six hatches were originally designed for the Commando. There were two hatches above the driver's and commander's stations, one in the turret roof above the gunner, two on either side of the vehicle on the upper portion of the hull sides, and a large two-piece hatch was fitted over the radio operator's position at the right rear of the vehicle. Early testing had shown the side hatches located on the upper hull were insufficient for the rapid entry and exit of crew from the vehicle. In 1965 the side doors were modified and became larger. The new design saw the doors take up most of

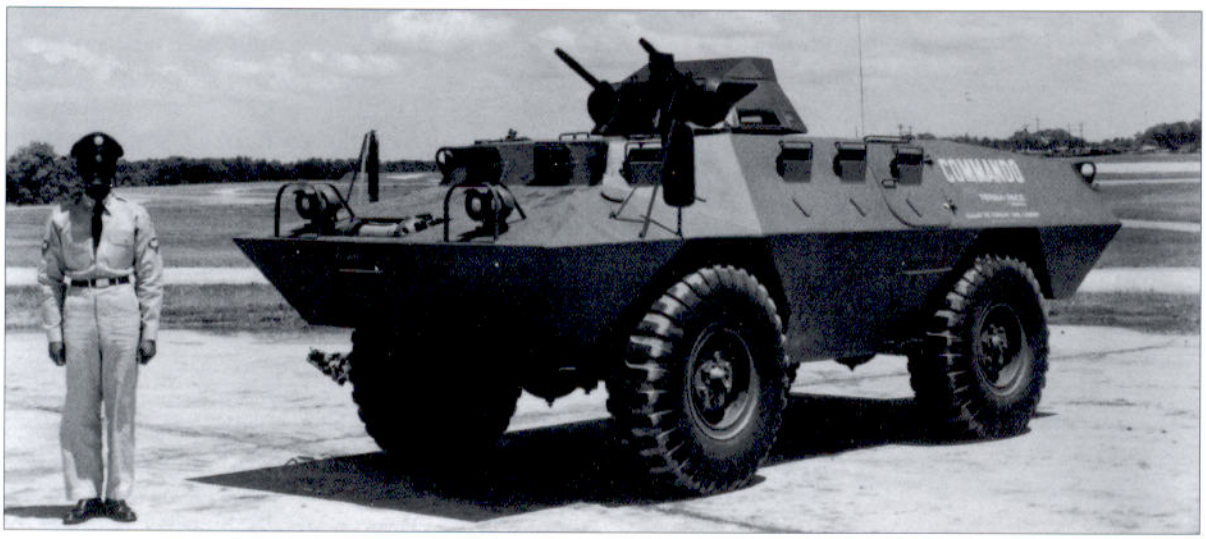


the side of the vehicle, splitting into two sections, with the upper door swinging to the side and the lower portion swinging down to form a step for the crew to enter and exit the vehicle. A door was also added to the rear of the vehicle. It was mounted on the left rear side of the hull and was originally designed as a one-piece door that swung up; this rear door was later changed to a two-piece unit similar to the side doors. The excess weight of a one-piece door had proven to be almost impossible for the typical Third World soldier to lift, and so the two-piece door was employed. The fitting of the door to the rear of the Commando also allowed troops to exit the vehicle under the protection of the Commando's armored hull.

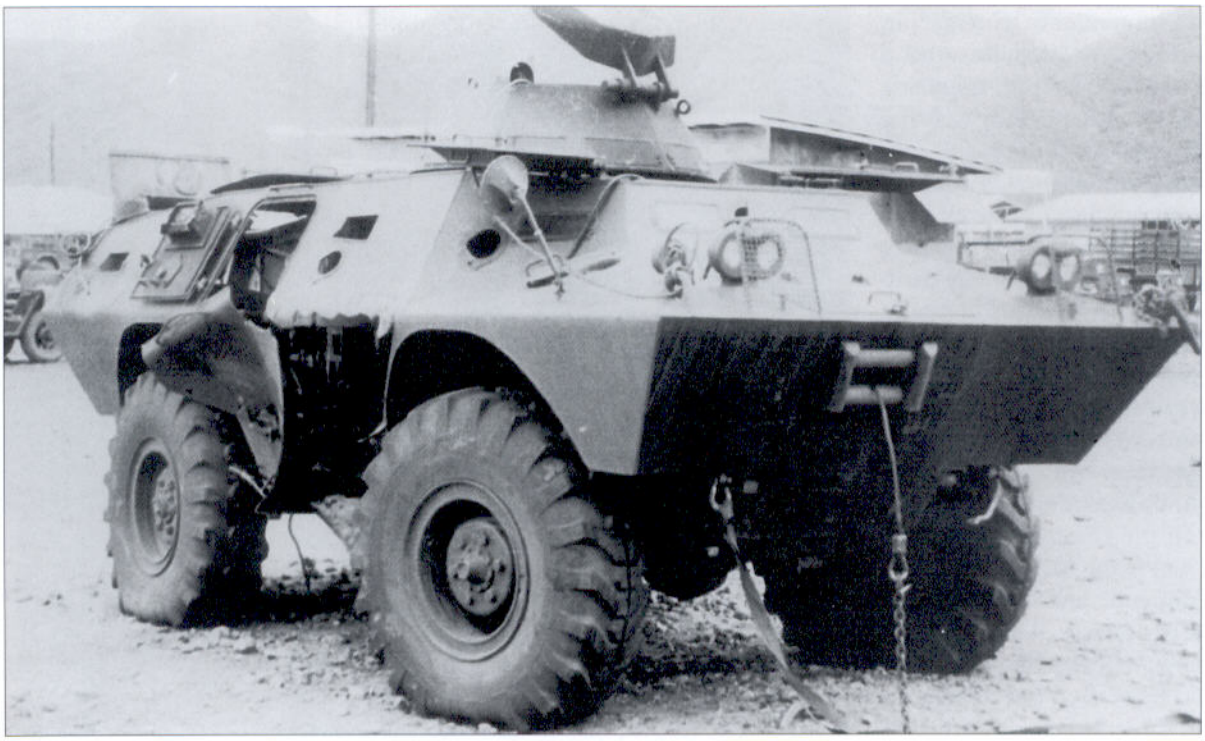
Power-train

The engine and power-train components (transmission, transfer case and drive shafts) as well as the fuel tanks, radiator, exhaust, and hydraulic reservoir were all enclosed within the Commando's hull. The air intake and exhaust were located on the top of the hull. The Commando was fitted with a Chrysler M75 V-8 361 cubic inch displacement-engine and was rated at 191 horsepower. The engine was a militarized version of the Chrysler engine that was used in heavy trucks at the time. The United States military also utilized the same engine in the M113 series armored personnel carrier and other vehicles that were in use at the time. This commonality meant that the parts for the Commando were already established within the United States military logistics system. Sales brochures of the time referred to a diesel engine as an option, but none were ever fitted until 1978 with the production of the V-150.

The engine was mated to a New Process 540 manual transmission, which gave five forward speeds and one reverse. However, the first gear proved to be too low geared and snapped the rear axle shafts, so it was soon locked out with the use of a sliding plate located under the shifter plate. To engage the first gear the driver would shift the transmission to neutral and engage the four-wheel-drive lever, which would slide the plate out of the way of the first gear slot and allow first gear to be engaged. First gear was only used for four-wheel-drive operations.



This photograph, which was taken at Aberdeen Proving Ground, shows one of the Commando prototypes with a soldier standing next to it for reference. The rear quarter panel has stenciled on it "Commando by Terra-Space Corporation." The original turret has now been replaced by a new design with guns mounted on the exterior edges of the vehicle.



The force of a rocket explosion has ripped away the side of this V-100 and has blown out the vision blocks and gun port covers. The cables attached to the front of the vehicle suggest that it was flipped onto its side by the blast and later righted when it was recovered.

The heart of the Commando was the transfer case. The engine in the Commando was located at the rear of the vehicle, with the rear of the engine facing the front of the vehicle, so the transfer case took the input from the transmission and turned it 180 degrees to turn the drive shaft to the rear axles. The vehicle normally operated with only the rear wheels being driven.

Twin 40 gallon fuel tanks were mounted internally on either side of the nose and were integral parts of the Commando hull, giving an operating range of up to 600 miles with an average fuel consumption of between five and six miles per gallon.

Axles

The axles of the Commando were based on the M44 2 1/2 ton truck in use by the US armed forces at the time. The axles were waterproof and had double reduction gearing. The differential assemblies were fitted with locking-type traction aiding devices and accepted a 19 spline axle as opposed to the 17 spline axle used in the M44 series trucks[1]. The axles were mounted to the hull of the vehicle by a leaf spring and shock absorber suspension system.

Tires

The tires mounted on the Commandos were a special "run-flat" tire developed by Cadillac Gage. The tires contained a metal liner on the inside wall, as well as heavy-duty steel wires in the tire sidewall. The solid construction of the tires, dubbed the Commando Special, allowed the

1. The problem was finally resolved in later production with the V-150, when heavier duty 5 ton axles from the M54 series trucks were used in place of the 2 ton axles.

Commando to run for an additional 50 miles after a puncture before requiring replacement. One of the drawbacks of the heavy construction of the Commando Special tires, however, was the requirement for heavier duty tools to remove them from the rims. Additionally, a spare tire or jack was not issued with the Commando. However, it was not uncommon for some units to loop the winch cable onto a spare tire and carry it on the front of the vehicle. Removing the Commando Special tires from the rim was extremely difficult, and most maintenance units did not have the unique tire demounter. As a result, mechanics were forced to be extremely imaginative when replacing Commando tires, and in some cases they had to burn the tires off the rim in the absence of any other available means.

ABOVE **One of the original prototypes fitted with a prototype 20mm turret at Rock Island Arsenal. The turret was never used, but experience led to the replacement of the periscopes with vision blocks.**

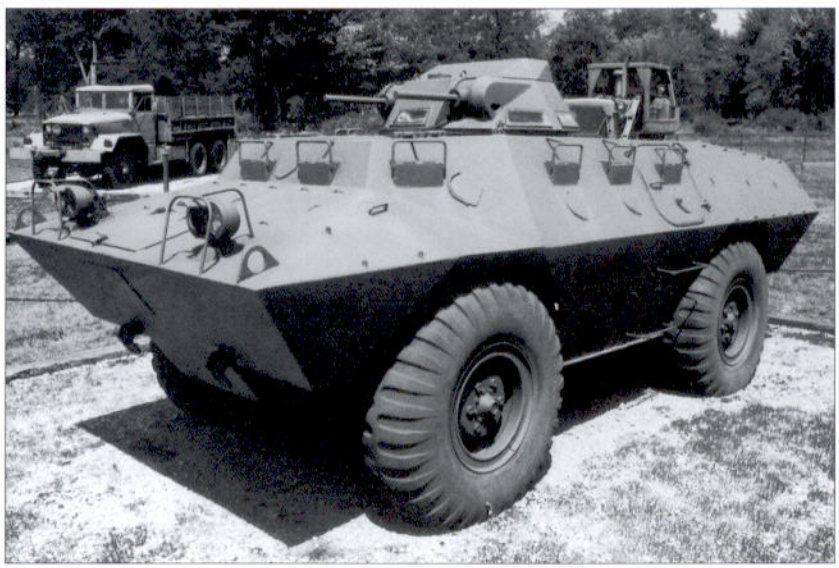
BELOW **A front view of serial number 10002 located at Fort McCoy Museum. The locations for the periscopes, which are not fitted, are visible. The side door has now been added and the turret changed to mount the twin machine guns on the outer edges of the turret. The later Cadillac Gage 1m twin machine gun turret used the same arrangement for machine guns.**

Steering

The Commando was fitted with a Ross power-steering system with a hydraulic cylinder mounted on the outer side of the hull and to the steering-gear arm on the front axle. Two arrows facing straight ahead were painted on the power steering shaft inside the Commando hull. These aided the driver to keep the wheels straight ahead during deep-water fording or amphibious operations.

Because the Commando was designed to be amphibious without preparation, a bilge pump was fitted to handle quickly any leakage of water that could occur during fording operations. The bilge pump could expel 50 gallons of water per minute, which would in normal conditions handle the leakage from the doors and gun ports. Top speeds of 4mph were possible in full amphibious operations.

In case the vehicle became mired or stuck, a 10,000lb Braden hydraulic winch operated by a Power Take Off (PTO) on the transmission, was fitted to the front of the vehicle for self-recovery. An additional recovery aid was the 5 ton snatch block, which was standard equipment on the V-100.



Mock-up of the 20mm turret on one of the prototype V-100s. Developed at Rock Island Arsenal in response to suggestions by US Army evaluators, this turret was not adopted but the design was later developed into the 20mm gun mount, as used on the M114 reconnaissance vehicle.

One of the features of the early Commando vehicles that never made it to production was a nose-mounted flamethrower. The flamethrower was billed as a crowd control device in the early sales literature, but no V-100s have been encountered with this device fitted; this is probably because of safety concerns over mounting a flamethrower so close to, and between, two externally vented 40 gallon gasoline fuel tanks.

Armament

Since the Commando V-100 was designed to be a multipurpose, multi-role vehicle, it was offered with a wide range of armament options. As production of the V-100 progressed, newer more advanced weapons were fitted to the vehicle. The original Commando V-100 vehicle only offered the option of twin machine guns fitted in a manually traversed turret. The turret was an oval-shaped casting, with the gunner located directly to the rear of the guns. In the early sales literature a gunner's seat and turret basket do not appear to be fitted; therefore the gunner would have had to stand the entire time the Commando was operational, and he would have had to manually turn his body when traversing the turret. Probably for these reasons, the early turret appears to have existed only in the initial development stages of the Commando. Optional machine gun combinations that were available were: twin .50-caliber guns; twin .30-caliber guns; and one .50-caliber and one .30-caliber machine gun. The Commando was advertised to carry 420 rounds of the .50-caliber ammunition and 1,000 rounds of .30-caliber ammunition.

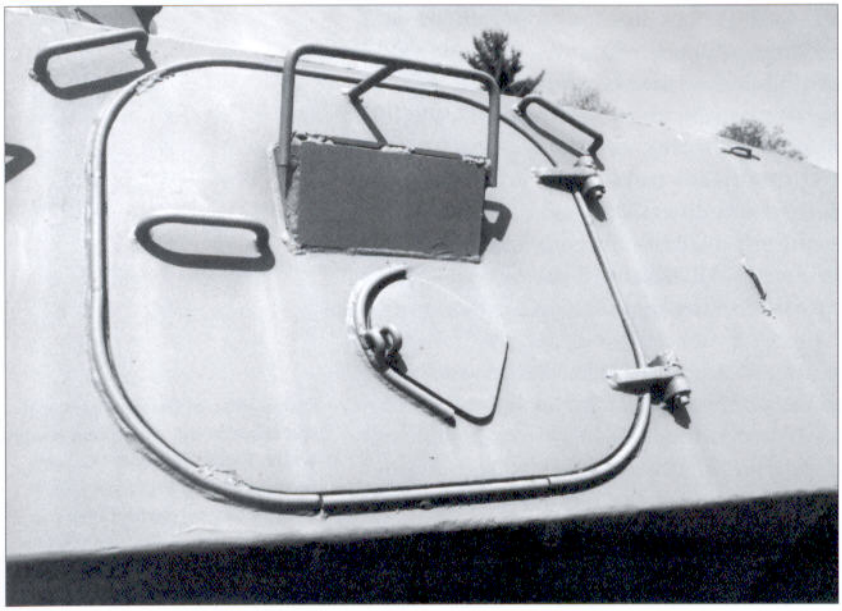
By 1964 the Commando had been redesigned to incorporate several changes that had been suggested as a result of military trials. The original turret was gone, replaced with three new designs that now featured a turret basket for the gunner to sit in. The first turret was labeled the T-60, and was fitted with.30/.50 machine guns, with manual controls. On this design the guns were moved to the sides of the turret similar to the aircraft turrets of World War Two. The next turret offered was labeled the T-90 and was for police use, and it featured vision blocks surrounding the turret. In place of a weapon were four tear gas grenade launcher tubes, which were fitted to the sides of the turret for crowd control. The final turret design offered was the T-70 turret. It featured a 20mm cannon in a high-sided octagonal turret with power

traverse and elevation controls. Despite the three different versions none were ever placed into production and they apparently only ever existed in prototype form.

Between 1964 and 1967 testing and development continued on the Commando turrets. By 1967 the T-60 turret had been changed to have the twin machine guns mounted side by side in a manually operated turret. The machine guns were located on the driver's side of the turret in the original design; however, they were later moved to the commander's side of the turret so that the feed direction on them could be changed. Several different models or combinations of machine guns could be fitted to the turret. Possible combinations included: twin M1919A4E1 or M37 .30-caliber Browning machine guns; twin MG42 or M73 or M219 7.62mm machine guns; and a heavy machine-gun combination of one .30-caliber M37 and one .50-caliber M2 machine gun. Interestingly, the Commando sales brochures make little mention of the Cadillac Gage's Stoner system machine guns being fitted to the Commando turrets. The final machine gun turret design was labeled the T-50, and it became the standard Commando turret through the rest of the V-100 production and into the production of the V150s. Late-production Commando turrets featured twin banks of grenade launchers on either side of the turret and optional weapon systems for either twin M60, M73 or FNGPMG 7.62mm machine guns or a single General Electric XM132 7.62mm mini-gun.

The manual turret was not the only armament offered for the Commando V-100. By 1967 the Commando sales brochures also offered an open-top pod for mounting machine guns in individual pintle mounts for base defense. Other armament options were a closed-top pod for command vehicles and for police vehicles, and an 81mm mortar carrier, for troop support.

A rear view of serial number 10002 points out details of the prototypes. In this photograph we can see the lack of a rear hatch, the twin hatches for the radio operator's position, the engine access hatch detail, and the engine exhaust tunnel detail. The radio operator's hatch will later be changed to a single hatch and reduced slightly in size. The engine access hatches on the prototype open to the side but will be changed to open to the front and rear of the vehicle. The rear of the V-100 lacks the mounting for the gas can and pioneer kit as well as the fording shroud, which was added in later production.



This view of the side access hatch allows us to see clearly the materials and manufacturing of the prototypes. Sections of rod have been used in the construction of the periscope guards, the edging around the hatch, and the edging around the gun port. Note the loops on the gun port for locking the port shut. Later production V-100s had a tab welded to the side of the door and one on the door for locking the vehicle shut. The Fort McCoy Museum has welded this door shut.

The 1967 sales brochure also indicates that the Commando offered the innovation of interchangeable modular components, which allowed Commandos to be reconfigured according to changing needs. Cadillac Gage Corporation applied for a patent for the modular design in 1967, but no V-100s were ever sold in this configuration.

The Commando was subjected to constant testing and improvement from the outset. Changes to the Commando design were applied throughout production without any change to the basic V-100 designation. The only way to track changes to the Commando was by serial number. Commando serial numbers were located on the front lifting eye in front of the driver, as well as inside the Commando on the data plates affixed to the shift tunnel cover next to the driver. Commando serial numbers began with the number 10,000 and progressed from there.

Early sales and testing experience with the Commando revealed a problem with the wheel opening profile. The early vehicles had the wheel-well openings in a squared-off angular outline. It was later discovered, however, that the hull would tend to crack from the corners of the angles' openings. After vehicle serial number 10075 (the 75th vehicle) the opening was changed to a more traditional rounded design, and at the same time, for easier maintenance, an access hatch was added to the batteries and engine on the left rear upper side of the vehicle.

To prevent flaming liquids from Molotov cocktails leaking into the engine compartment, starting with serial number 10457, a raised pagoda-style shield was placed over the air intake.

At mid-production (serial number 10596) of the Commando, the number of vision blocks located on each side of the upper hull, forward of the side troop doors, was reduced from two on each side to one. This was done to increase the ballistic rigidity of that section of the hull. The total number of vision blocks in the Commando hull was, thereby, reduced from 11 to nine. Most of the vehicles used by the South Vietnamese Army were of the earlier type, with the additional vision blocks.

Beginning with serial number 10509, drivers' and commanders' hatches were changed to allow for more headspace and to minimize head injuries on the hatches while traversing rough or uneven road surfaces.

Construction sequence

From the earliest days of Commando production, Cadillac Gage subcontracted the fabrication of the hull assembly. The early prototype

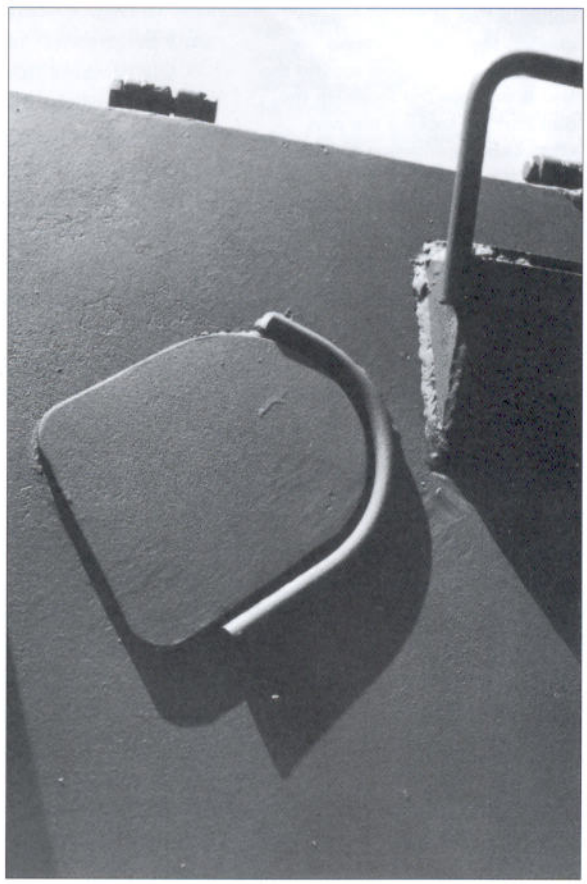
hulls had the upper and lower hull pieces welded together at the waistline to form the hull sides. In production, this was changed to a single piece of armored plate with a bend at the waistline of the hull.

After the initial armor plates were manufactured at a steel mill, the flat plates were shipped directly to Fruehauf in Delphos, Ohio, who in turn cut them to the size and shape required prior to welding. Fruehauf then fabricated the hull. Once complete, the hull was shipped to the Cadillac Gage facility in Detroit, Michigan, where the rest of the components were installed to complete the vehicle. After final assembly, the V-100 vehicles were transported to the various ports for final preparation and shipment to the customer.

By 1965 the Commando was judged ready for sales and production. News of the new vehicle was even published in the *Wall Street Journal*. The Ex-Cell-O Corporation now owned the Cadillac Gage Company, and all Commando production would be under the Cadillac Gage name. According to an article in the *Wall Street Journal* of October 13, 1964, the base sticker price for the Commando V-100 was $24,500. Russell E. Bauer, vice president of Cadillac Gage, predicted sales of about 200 Commandos that first year. Despite sales not fully reaching their predictions, in 1965 Cadillac Gage became the 21st largest producer of cars in the United States. The Cadillac Gage Company heavily marketed the Commando with a sales brochure in three languages; English, French, and Spanish.

Marketing efforts paid off in 1965, when the countries of Somalia, Sudan, and Oman became the first to purchase the new vehicle. The sales of the Commando added considerably to the legitimacy of the new vehicle, while also providing much needed data on user requirements and conditions.

Sales of the vehicle continued with the governments the Republic of South Vietnam, Lebanon, Bolivia, Guatemala, Venezuela, Nigeria, and Malaysia placing orders, along with several consignment and test sales to Saudi Arabia, West Germany, and Canada. But by far the largest sales and usage of the Commando was by the South Vietnamese armed forces and the US Army Military Police and US Air Force Security Police units in Southeast Asia.



Detail view of the gun port and the edge of the periscope mount, which was located at the rear of the vehicle. Early prototype V-100s did not have a rear access hatch. Later prototypes incorporated a one-piece door, which was later modified to a two-piece unit. Note the rod sections used in edging on the gun port and the detail of the weldments of the periscope mount.

V-100S IN VIETNAM

The story of the V-100 begins during the Vietnam War. It was there that its design was combat tested and proven. The Army of Vietnam, US Military Police and US Air Force all contributed to its unique development and evolution, and thus established a foundation for future armored vehicle standards, based on the V-100s.

Army of Vietnam

Cadillac Gage's second prototype V-100 (serial number 10001) was shipped to South Vietnam in

November 1963 for testing and evaluation. The South Vietnamese Army (ARVN) put the vehicle through its paces with US Army advisors looking on. The US Army advisors were impressed with the potential of the vehicle during early trials. Reports began to filter back to the various commands with several improvements in mind. One of these was the addition of a 20mm turret instead of the twin machine gun turret introduced on the V-100. The 20mm turret was produced and tested in late 1964, but never made it to production on the V-100. It was, however, further developed by Cadillac Gage, and it was later used on the M114E1 APC variant. Design improvements developed with the turret, such as the 3in. thick vision blocks, which found their way into V-100 production.

Subsequent testing of the V-100s at Fort Knox and Aberdeen Proving Grounds verified reports from Vietnam regarding the capabilities of this odd-looking vehicle. But, as always, different commands had different ideas. One such idea was that the Vietnamese should receive the M113.5 tracked APC (Lynx), but the ARVN had already voiced their concerns about other tracked vehicles after the failure of the M114s, and with the marginal acceptance of the M113, it left the US advisors few options. The debate continued for some time, and as late as January 1967 reports and studies were still comparing the capabilities of the V-100, M113.5, and M114.

The decision on the V-100 was briefly delayed with the coup of 1964, when ARVN General Nguyen Kanh seized power. After a brief reshuffling, the contract was signed and Cadillac Gage began shipping V-100s (now officially designated as the XM706) to South Vietnam in October 1965. But Cadillac Gage had not been idle while waiting for the US Army's Tank and Automotive Command (ATAC) to sign the contract, they pushed forward with production and deliveries of V-100s to Somali, Sudan, and Oman, along with consignment sales to Saudi Arabia, Canada, Venezuela, and West Germany.

An early production V-100 shown at a firing range in South Vietnam, this vehicle was one of the first to be delivered to the ARVN troops. ARVN experience with the V-100 would lead to a number of improvements. An M41 Walker Bulldog light tank is pictured in the background.

Three ARVN V-100s on patrol somewhere in South Vietnam. All the vehicles pictured have an M1919A4 machine gun mounted at the rear for additional firepower. The commander in the lead vehicle is carrying an M79 40mm grenade launcher. The truck pictured is an M601, which was a militarized export version of the WM-300 1-ton Dodge Power Wagon. (Copyright Cadillac Gage Textron Inc.)

The XM706s began to arrive in South Vietnam shortly after yet another coup orchestrated by General Nguyen Cao Ky. These coups had caused the ARVN commanders to hold their new equipment and vehicles in reserve in the event of yet another coup, and this remained the situation until the South Vietnam elections of 1967.

Though the V-100s saw little real action initially, the commanders soon saw the need for improvements, which ATAC and Cadillac Gage incorporated as soon as feasible. Improvements included adding a screen mesh in front of the headlight assemblies, and the addition of a hatch on the left rear side of the vehicle to provide access to the engine, air cleaner, and the batteries (previously accessed only through the top engine hatches).

Standard military, non-directional 14.00 x 20 tires were first used on the V-100s. These tires could be punctured easily, thus immobilizing the vehicle; this prompted Cadillac Gage to develop a thick side-walled tire that could run with zero inflation for up to 50 miles without damage. The new tires, which were patented and named the "Commando Special", were retrofitted to vehicles as soon as shipments arrived in the country.

Additional testing of tire designs and wheel add-ons continued for some time. One such wheel modification was a large 40in. metal disc with paddles welded to the outer edges. The bolt-on paddle disk worked well during amphibious swim testing, but it failed miserably during deep mud crossing testing. This negative result, coupled with the additional weight added on to the vehicle, meant that the paddle idea was soon scrapped. Another test was the use of foam-filled tires. However, concerns over uneven tire wear, resulting in a saw-toothed tread wear

Two V-100s patrolling along a road. The yellow lettered "TC" within a red circle signifies that this is a V-100 belonging to an ARVN cavalry unit. These two V-100s are armed with a combination-mount, consisting of a .30 M37 or M1919A4 machine gun and a .50 M2 machine gun. (Copyright Cadillac Gage Textron Inc.)

pattern and the fact that the tire and the rim had to be replaced after the tire was damaged due to gunfire, lead to the abandonment of this experiment.

One of the chief complaints about the XM706s from the ARVN users was that the twin .30-caliber machine guns did not deliver enough firepower. The ARVN commanders requested something that would penetrate the dense undergrowth common along the narrow roads, i.e. a .50-caliber machine gun or the new 40mm grenade launcher. US Army advisors also reported this back to ATAC and Cadillac Gage, who in turn developed a quick solution to the problem in the form of a retrofit kit that would convert the existing twin .30 machine guns to a combination .30/.50 turret. The kit consisted of a new flexible ammunition chute, ammunition storage box and mounts front and rear for installing the M2 and M37 machine guns.

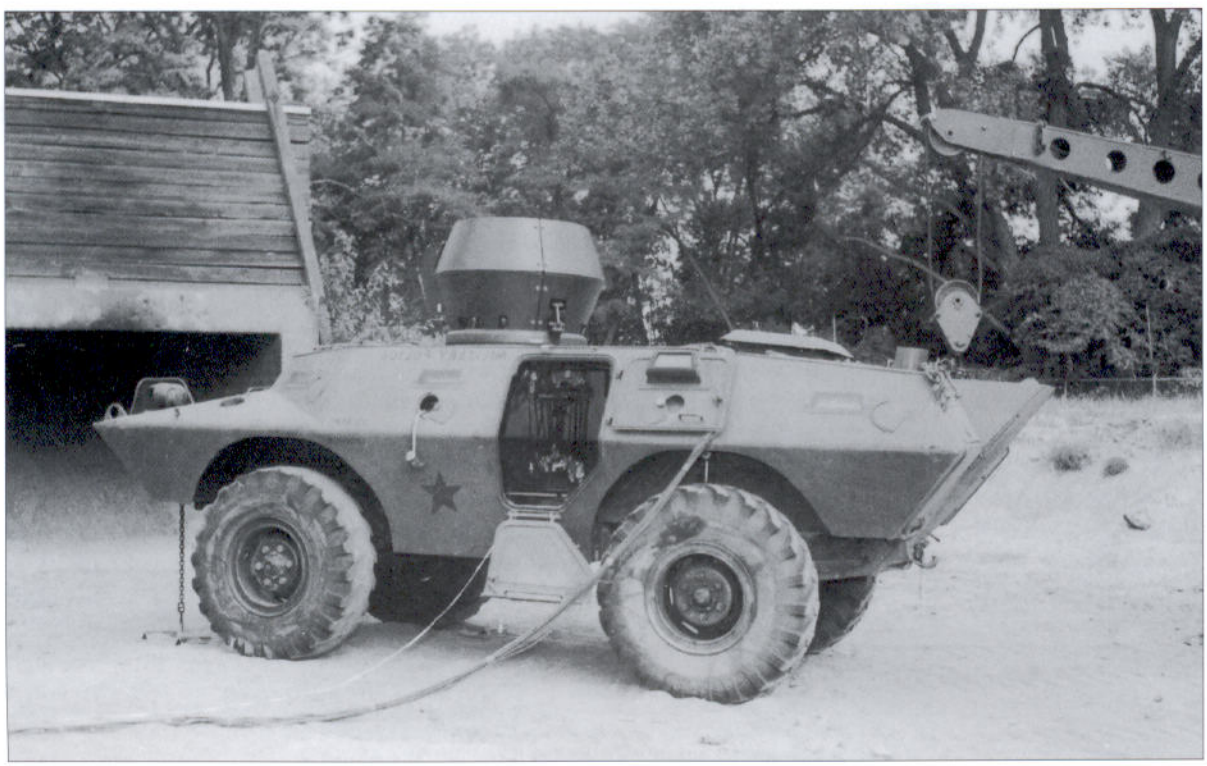
The retrofit kit increased the deliverable firepower, but ATAC wanted to further it with the use of the automatic 40mm grenade launcher. The XM32 turret system was developed by the army and tested in late 1966 until early 1967, but it failed to meet requirements. Several other 40mm systems were tested, with the most promising being the XM129 turret. The testing of this system continued from 1967 to 1971, but by then, the requirement melted away as the US troop withdrawals became more frequent[2].

2. It is interesting to note that the 40mm turret system was finally developed by Cadillac Gage and accepted by the US military in 1986 and is still in service with the US Army MPs on the M1117, USMC AAV7A1 and Turkish National Police V-150ST.

Ammunition storage for the twin .30 MG turret was 500 rounds per weapon, giving it a total of 1,000 rounds in the turret. The .30/.50 MG turret configuration was 500 rounds for .30-caliber and 200 rounds for the .50-caliber. However, whether 700 or 1,000 rounds, ammunition would not last long during intense firefights, meaning that the turret gunner would have to reload almost as soon as the firefight began if he was inexperienced or did not use controlled short bursts. To overcome this problem, the ARVN V-100 crews mounted an M1919 MG on a tripod at the rear of the vehicle to provide cover fire while the gunner was busy reloading. This problem resurfaced when the US Army Military Police began using the V-100s in late 1967.

The crew also carried M1 carbines, M1911A1 automatic pistols, and an M79 grenade launcher, all of which could be fired through the vehicle's gun ports. However, it quickly became apparent that the vehicle would fill with smoke if the engine was not running and the front radiator vent in the vehicle was not open to draw the smoke out. Requests for an exhaust fan to pump out the smoke were submitted but it was never deemed critical enough to be incorporated into the design.

The heat in Vietnam made it very uncomfortable inside the XM706, so crews tried to cool themselves by leaving the upper side-doors open while patrolling. The open doors soon became easy targets, however, with enemy soldiers shooting into the open doorway to send bullets ricocheting inside the vehicle to devastating effect. An even more worrying situation occurred when an attacker was close enough to hurl a hand grenade or satchel charge into the open door, leading to the complete destruction of both crew and vehicle. These lessons, too, would be relearned by US Army Military Police a short time later.



Detail view of the 40mm turret of a V-100 at Rock Island Depot. At least one example of this turret was shipped to Vietnam but it arrived too late in the conflict to be put to good use.

Detail shot of the lead V-100 in a convoy, clearly showing a rear tripod-mounted machine gun, the commander's M79 grenade launcher, and the twin M37 or M1919A4 machine guns. This vehicle like all the others in the convoy carry the barbed wire for crew protection during bivouacs at night. (Copyright Cadillac Gage Textron Inc.)

Landmines were a constant threat to both ground troops and vehicles, but the V-100 fared well against them. In most cases when a V-100 hit an anti-personnel mine the damage was minimal and repairable, usually restrict-ed to a wheel or axle assembly and nothing more. As for the crew, they too fared well unless they happened to be riding on top of the vehicle and were thrown to the ground by the explosion.

Rocket Propelled Grenades (RPGs) and B-40[3] rockets were rather more problematic for V-100 crews. There was little to protect against such weapons, particularly in the case of the RPG. The RPG was lightweight and easy to operate, and the Viet Cong (VC) had the advantage of being able to fire and disappear back into the jungle, only to emerge elsewhere to fire again. Another favored tactic of the VC was to lash an RPG to a tree or suitable fixture and set it to fire into the road after being triggered by a trip wire or a pressure switch pressed by a vehicle on the road. A V-100 hit by an RPG was usually knocked out of commission or destroyed outright. Mechanized infantry and armored cavalry units countered this threat with rolls of chain link fence, which they would erect around their vehicles when they were bivouacked, but when driving there was nothing that could be done to guard against RPG attack. The idea behind the chain link fence was that the incoming rocket would hit the fence and detonate before it could harm a vehicle within the bivouac.

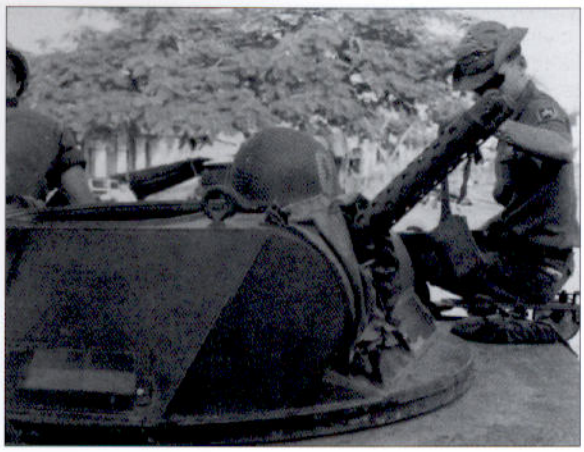
By late 1965 reports of cracks in the V-100 hulls were making their way back to ATAC and Cadillac Gage. The reports indicated several vehicles exhibited noticeable cracks, and a thorough inspection was called for on all XM706 in the ARVN inventory. Meanwhile, Cadillac Gage reviewed the welding processes at Fruehauf and found that procedures had not been followed. The chief deficiencies were caused because the Fruehauf hull assembly plant area was neither heated nor was the armor plate being preheated prior to welding. Recent labor problems at Fruehauf only added to the situation. It is critical when welding Cadaloy armor plate that the edges of the plate are properly dressed and the heat evenly distributed. Cooling is accomplished in stages to prevent cracking from internal stress. Cadillac Gage revised and implemented a strict welding procedure, with step-by-step guidelines for the fabrication of the hull.

Inspections in Vietnam were completed and those vehicles deemed repairable were repaired in country, while the more severely cracked

3. The B-40 rocket had a maximum effective range of 490 yds or 1,090 yds if "dumb-fired".

units were returned to USA for evaluation and repair or replacement. Cadillac Gage developed repair procedures and replacement sections where it was possible to replace entire sides, noses, rear panels, roof plates, or belly pans as needed.

In May 1966 the flow of new V-100s to the ARVN stopped; this was partly caused by the review into the cracking problem, but also due to a rush production order of 40 V-100s to Sudan[4]. The ARVN deliveries resumed in February 1967, when several improvements had been made to V-100. First, a fording shroud was added around the exhaust grille to prevent water rushing in when the vehicle exited from an amphibious operation. Secondly, the first gear lockout plate was located under the transmission shifter lever to prevent the use of first gear in two-wheel drive. There were also some weldment improvements, including ballistic backup strips inside above both front-wheel wells, and finally spring retainers were added for the driver and observer hatches.



Detail of the twin M37 or M1919A4 .30-caliber machine guns mounted on the T-50 turret. This is a later turret, as the earlier models had a narrower vision block in the front to compensate for the width of the .30 M37/.50 M2 machine gun mount.

United States Army Military Police

In 1965 the United States became more directly involved in the war in Vietnam, and the first battalion-sized military police units were deployed. The original duties of these units were to enforce the laws and regulations of the US military and to provide security for installations. As the buildup of US forces continued, the need for greater numbers of military police increased. The United States Army Vietnam Command (USARV) wanted the military police to take a more direct role in the war to free front-line troops for combat duty. One of the new missions assigned to the military police was route and convoy security.

Meanwhile the US and Allied troop buildup in South Vietnam accelerated. New US Army advisors arrived in Vietnam, but with personnel only on a single year's duty, there was barely enough time to learn what was needed to survive before rotating back to the United States. The lessons of earlier advisors were lost each year, as newcomers had to adjust to conditions that their predecessors had just grown used to. Replacement advisors and unit commanders quickly experienced security problems on their bases and with supply convoys.

Convoy activity in Vietnam increased as each new Allied unit arrived, and with it the problem of security for vital supply routes grew more significant. Until late 1967, M151 jeeps with mounted M60 machine guns were the standard for road security, but the lack of protection for crews only added to the causalities when attacked. US commanders looked for ways to improve the situation and to reduce casualties among security personnel.

In September 1966 the newly activated 18th Military Police Brigades[5] arrived in Vietnam. The 18th was broken into three groups: the 8th MP group, which preformed criminal investigations; the 16th MP group, which controlled the military police units stationed in the northern 1st

4. Sudan's urgent requirement for more V-100s was a direct result of the increased rebel insurgency in the country.
5. Independent and not part of existing divisional military police units already stationed in Vietnam.

During the 1967 Detroit riots, Cadillac Gage lent several V-100s to the Michigan State Police. These vehicles were probably destined for ARVN units in Vietnam. Barely visible is the word "SOLD" written on the front nose of the lead vehicle. (Copyright Cadillac Gage Textron Inc.)

and 2nd tactical zones; and the 89th MP group, which controlled the MP units stationed in the south, the 3rd and 4th tactical zones. The purpose of the 18th Military Police Brigade was to create a better organization and to exercise control of the military police units in South Vietnam. Until the activation of the 18th Brigade, the independent military police units had been under the control of commanders of the four tactical zones in South Vietnam. At the height of the war, there were over 6,000 military policemen in Vietnam. The first large-scale operation of the 18th Brigade was providing convoy security and traffic control during Operation Deckhouse and Operation Attleboro in November 1966.

As individual units of the US Army began to deploy throughout South Vietnam, the Army found themselves at the end of an immense logistical pipeline that stretched all the way back to the United States. Every round of ammunition and case of supplies had to be moved via long truck convoys from the ports and supply depots to the soldiers in the field. These supply convoys became the thin thread of survival that stretched hundreds of miles on the roads of Vietnam.

The tactic of attacking an enemy's road network and disrupting the supply flow of one's enemy is ancient. Safeguarding supply routes traditionally required the commitment of large numbers of front-line troops, and effectively removed them from the battlefield. Each convoy destroyed meant fewer supplies for use. Additionally, looted convoys have long been a source of supplies for the attackers and black-marketers.

The Viet Cong and North Vietnamese troops were no strangers to attacking supply convoys. During the French involvement in Indochina, the Viet Cong (or the Viet Minh as they were known then) became adept at staging attacks on convoys, often with huge success. Against this experienced enemy, the 18th Military Police Brigade faced a stern test.

The first Commander of the 18th Brigade, Col. Thomas F. Guidera, soon discovered the magnitude of the task confronting his men. Besides having many of the subordinate military police battalions and

companies scattered throughout the country and trying to adjust to a new way of life, the 18th Brigade quickly found themselves rewriting the MP mission book. The hardships of inadequate housing and support facilities were easily corrected, but the road system in Vietnam was not. These lifelines that crisscrossed the country were far removed from what the US military was used to; they were narrow, often unpaved and congested. The state of Vietnam's roads added to the MP's already growing headache of ever-increasing supplies convoys.

Under its Table of Organization and Equipment (TO&E), the typical military police unit was issued with the M151 quarter-ton jeep. For convoy operations, the M151 was armed with a single, post-mounted M60 7.62mm machine gun. However, in an ambush situation, the jeep, which had no armor, afforded little protection against the 7.62 x 39mm bullets of the Viet Cong rifles and was useless against land mines and RPGs. Attempts to add protection to the M151s, by placing sandbags on the floor and welding armor plate to the sides of the vehicle, were rarely successful.

Col. Guidera, who was faced with staggering casualty figures for MPs wounded or killed while on convoy duty, knew something had to be done quickly. US Army combat units were hard pressed with their own problems, and the army could not spare the MPs either the vehicles or the manpower to help them. To make matters worse, the Military Police Doctrine says nothing about MPs having armored vehicles. The Doctrine, however, was established during World War Two where battle lines were known. In Vietnam, there were no battle lines.

While the military police were aware of the need for an armored car to aid convoy and route security, convincing the US Army of a genuine need was a different story. The US Army had last used armored cars during World War Two, and since then such vehicles had been declared obsolete and removed from active units. The army saw little need for lightly armored cars in the modern, conventional battlefield of the 1960s. The trend since 1945 had been to fully mechanize and place troops into fully tracked personnel carriers.

An evaluation V-100 from 720th MP in Saigon during the Tet Offensive. The 720th MP transferred two V-100s to the 716th MPs in Saigon to assist them in repelling the attacks in and around the city. This is probably the same vehicle as shown previously. Note that the left headlight sports the same dark lens as the one shown on the previously illustrated example. The rear-view mirrors are now edged in white.

An ARVN V-100 shown in the 716th MP motor-pool during the Tet Offensive. ARVN registration numbers, as shown on the front of this vehicle, carry a number prefix for weight class, in this case an eight and then the actual registration number.

An armored kit was developed for the M151 and evaluated by the units in Vietnam. In a report dated November 1966, the 95th MP Battalion pointed out some of the shortcomings in the armor kits for the M151. The unit reported that, while it provided adequate protection, the kit overloaded the suspension of the truck and limited the visibility and space for the policemen in the vehicle. Additionally, the gunner was exposed when he stood up to fire the post-mounted machine gun. Since the top of the jeep was also still exposed, the vehicle remained vulnerable to hand grenades. The armor kit hampered any emergency exit by policemen. Finally, once the armor kit was installed on a jeep, the vehicle was removed from any other duties. The 95th MP Battalion concluded that MPs utilize the V-100, currently employed by the Vietnamese forces, for escort and operation in hostile areas. By 1967 the military police were escorting over 2,400 convoys a month throughout Vietnam.

The military police organization was not totally unfamiliar with the V-100. An article appeared in the *Military Police Journal* in 1964 reporting on the then new vehicle, and in 1965 an article reported on the need for an armored car for convoy operations. In 1966, the 716th MP Battalion stationed in Saigon inspected and test drove a V-100 and found it very desirable for MP work. The 716th Battalion observed that, while the V-100 was good for convoy escort, it was restrictive in the close confines of a metropolitan area like that of Saigon. They passed the information onto the 18th Military Police headquarters for further study.

Col. Guidera had also noticed that the ARVN Armored Cavalry and QC[6] units had a strange-looking APC that was on wheels and not tracks like the M113s. Guidera found that this angled vehicle was called a V-100 Commando and that the ARVN had owned them for just over a year. He was impressed with what he heard about the new vehicle and by the twin machine guns mounted in an enclosed turret. It seemed the military police had found the answer to their problems.

Guidera arranged to borrow an ARVN V-100 and for a US Army 16mm camera crew to document an experiment for the benefit of the US government. He had the V-100 positioned in front of the camera

6. QC was the South Vietnamese Army's version of military police.

crew and an M60 machine gunner. Guidera and his executive officer donned flak jackets and climbed inside the V-100 and latched the doors behind them. With the two officers inside the armored car, the signal was given for the M60 gunner to open fire on the armored car. While the camera captured the violent scene, dust and dirt danced around the armored car, and the surface of the Commando exploded with dozens of splattering hits from the 7.62mm rounds. The order "cease-fire" was given, and the machine gunner stopped and cleared his weapon. Dust still hanging in the air, the door of the V-100 opened and out stepped the commander and his executive smiling and somewhat stunned from the recent hammering but unharmed. The camera crew captured the entire event. The film was processed and submitted with a request for an armored car, specifically the V-100.

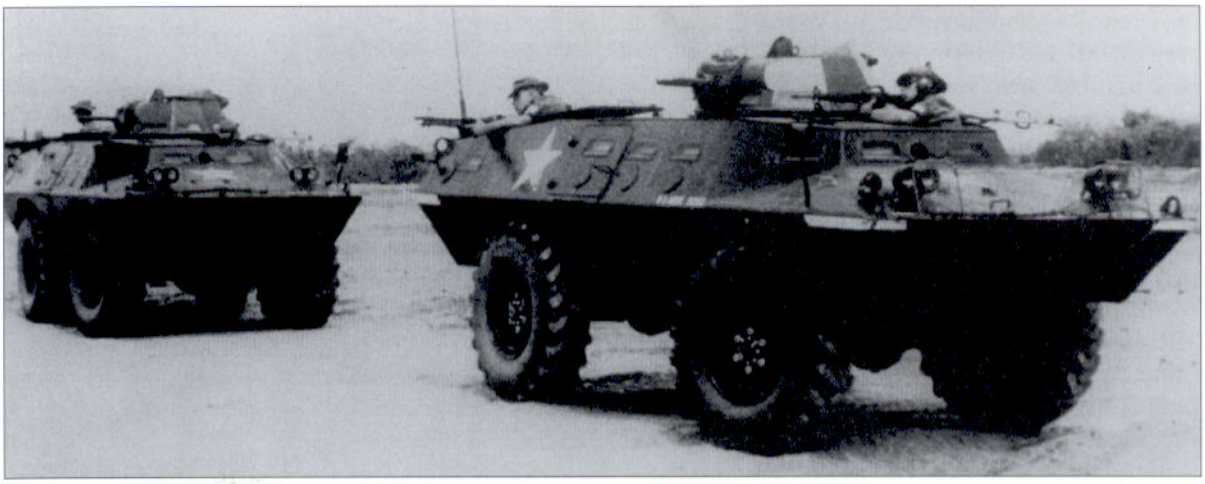
By now the US Army planners finally recognized the need for an armored convoy escort of some type. One of the initial responses from the army to the military police was a comparison of the V-100 with other escort alternatives; namely the M113.5 armored personnel carrier and the M114 reconnaissance vehicle. The M113.5 was a variant of the US Army standard M113 personnel carrier and differed in having a rear-mounted engine, a side door for rapid entry and exit, and the front of the vehicle had a revised profile. These were the same options offered to the ARVN some two years earlier.

The report found that the V-100 suffered from some difficulties; namely a noisy transmission and difficult shifting pattern, loss of traction in the mud or rice fields, and a cramped gunner's turret. The V-100 was also not an established vehicle in the army supply system, making obtaining parts more difficult. To be fair the report did find quite a few faults with the M114 vehicle as well, and it went on to recommend that the M113.5 be obtained as escort vehicles for the military police, as the majority of the parts were already in the army supply and logistics system.

However, two major points that the report overlooked were that, as a wheeled vehicle the V-100 was less destructive on the South Vietnam road system and that the 361 cubic inch V-8 engine allowed the V-100 to keep up with rapidly moving convoys. Additionally, tracked vehicles were expensive to operate and maintain, and military policemen were neither trained nor sufficiently supported to maintain tracked vehicles.

One of the avenues that the military police decided to use to obtain the V-100 was to file an ENSURE (Expedited Non Standard Urgently Requested Equipment) request with the

Military policemen of the 504th collect an early evaluation V-100 at a depot in Vietnam. Notice that 18th Military Police emblems have been painted on the front of the vehicle.



Military policemen train with their new vehicles on the firing range in Vietnam. The V-100s are part of the three evaluation units assigned to the 720th MPs. Note the stars on the front nose of the two vehicles, and the twin M37 .30 machine guns. The lead vehicle is carrying clearance markings on its front and rear corners; a feature seen only on some early units. The radio operators are firing M60s from the rear of the vehicle. The earmuffs worn by the lead driver confirm that this photograph was taken on a range.

army. ENSURE was a program to purchase and test new equipment in Vietnam, and it was managed by the Army Concept Team in Vietnam (ACTIV). The ENSURE program avoided lengthy trials and appropriations requests, which could take years to complete.

By this point the ARVN had over 200 XM706s in their inventory and more on the way. In May 1967 the Military Assistant Command in Vietnam (MACV) received permission to divert six XM706s from the ARVN for evaluation testing by ACTIV and US military police. The six XM706s were received early in June by the 18th MP Brigade, who divided them into two groups, issuing three to the 720th MPs at Long Binh and three to 504th MP Battalion, stationed at Phu Thanh. Maintenance support and operational training for the V-100 was to be provided by the ARVN, namely the 3rd Armored Cavalry Regiment.

One of the first issues to be addressed, was how the V-100s were to be armed. The V-100 offered the option of either twin .30 M37 machine guns or a combination of a .50 M2 and a .30 M37 machine gun to be mounted in the turret. Initially the US Army expressed a preference to order the combination mount, but at the time of ordering the .50 M2 machine gun was in short supply and was unavailable for the planned March/April 1967 production date. Based on these facts, the commanders agreed to use the twin M37 machine gun models on the proviso that the heavier M2 machine guns would be shipped to Vietnam with conversion kits when available.

From the beginning the military police had to teach themselves how to use and operate the V-100. When the new vehicles arrived, the ARVN 3rd Cavalry Regiment was supposed to provide training. However, this instruction proved of little value, and the military policemen settled down to reading the manuals and figuring the vehicles out on their own. A typical crew consisted of a driver, gunner and radio operator. If available, a fourth crewman was added, usually a Vietnamese QC, who functioned as a loader for the gunner and as a translator. The gunner was usually the commander of the V-100. While some units did provide familiarization training with the V-100, for the most part a crewmember's job was learned on convoy escorts. The crew was trained in each position so that they could operate wherever they were needed in the vehicle. With the constant turnover of personnel in a military police unit (an MP's tour of

duty lasted only one year), crewmembers constantly had to train new replacements.

Units were instructed to issue monthly status reports on their test results for the next three months to the 18th MP Brigade commanders. The 504th MP Battalion V-100s became operational in early June 1967 and were well received, both by the troops they were convoying and the military police themselves. The 504th's first status report related how the V-100 was superior to the armor-plated M151 and was much preferred to the standard M151 for convoy escort duties. Another problem that immediately came to light concerned the twin .30 M37 machine guns. By 1967 the M37 was no longer an issued weapon to US troops, and most had been replaced by the newer M60 machine guns. Additionally, US forces were now using 7.62 x 51mm ammunition, and .30-caliber ammunition was no longer available for the MPs to use in their new armored cars. The 504th recommended replacing the M37s with M60 machine guns from the armored jeeps the Commandos were replacing.

"Snoopy", a V-100 of the 560th MPs maintains watch while escorting a convoy. This is a later production V-100, a fact evidenced by the raised hatches. The gunner has attached a bandolier of M16 magazines around the exterior of the vehicle. Artwork of Snoopy flying his trademark doghouse in an MP's helmet is clearly visible. Notice that the crew are each wearing a different helmet. The driver wears a combat vehicle crewman's helmet, the gunner the standard US Army helmet with cover, and the rear radio operator wears a helicopter pilot's helmet. The helicopter helmet was popular with crews as it combined the helmet, headset, and microphone into one unit, along with a visor to protect the eyes.

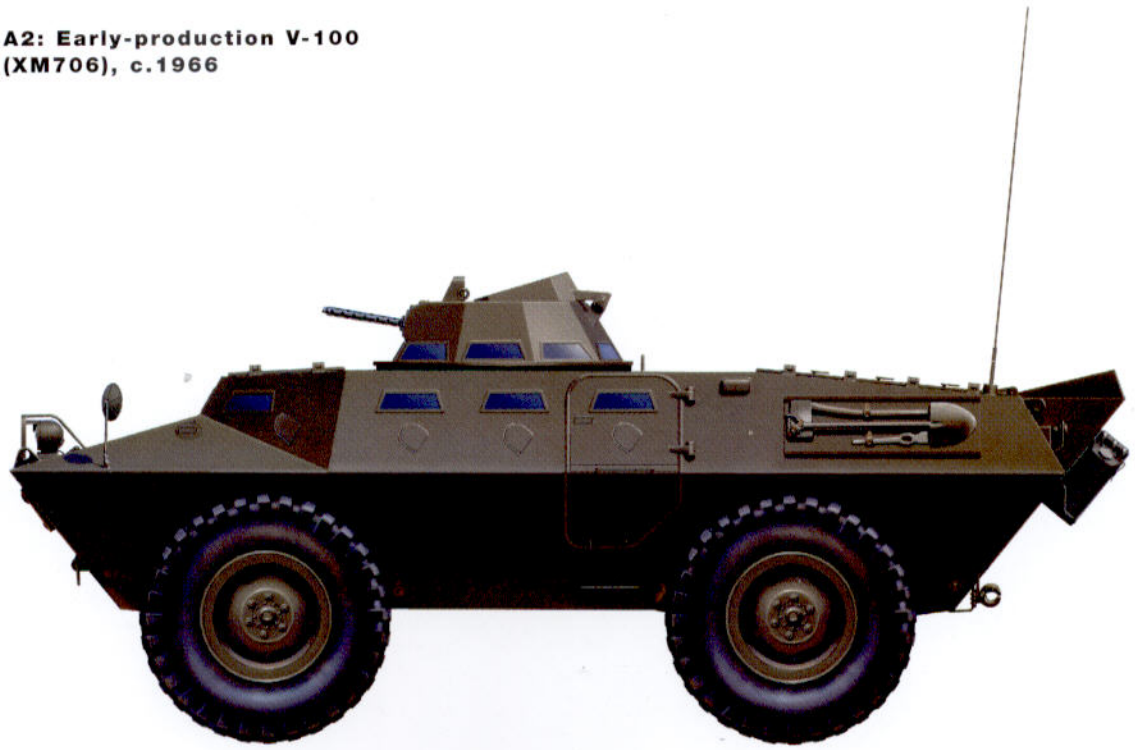
The 720th reported similar findings in its initial report, and further recommended that a machine gun be mounted on the rear of the vehicle by the radio operator's hatch to supplement fire from the turret-mounted guns. Another issue was that the M16, with its high front sight, had difficulty firing through the V-100's firing ports. An additional feature that the 720th MPs found desirable was the mounting of small claymore mines (called appropriately "claymorettes") around the exterior of the V-100 hull for close-in protection.

The next two monthly evaluation reports from the 504th and 720th MP units are consistent with the initial reports with few new findings. The 504th reported that the V-100s averaged six miles per gallon during a 117-mile convoy. Additionally, during the 11-hour convoys, the gunner and the driver became fatigued due to the seats installed in the V-100. The 720th expressed a concern that, with the volume of convoys increasing it could only assign one V-100 per convoy. By November 1967, the 18th Military Police Brigade evaluated the findings and judged the trials a success.

Meanwhile, throughout South Vietnam in late 1967, intelligence reports indicated that the VC and NVA were building up for "something

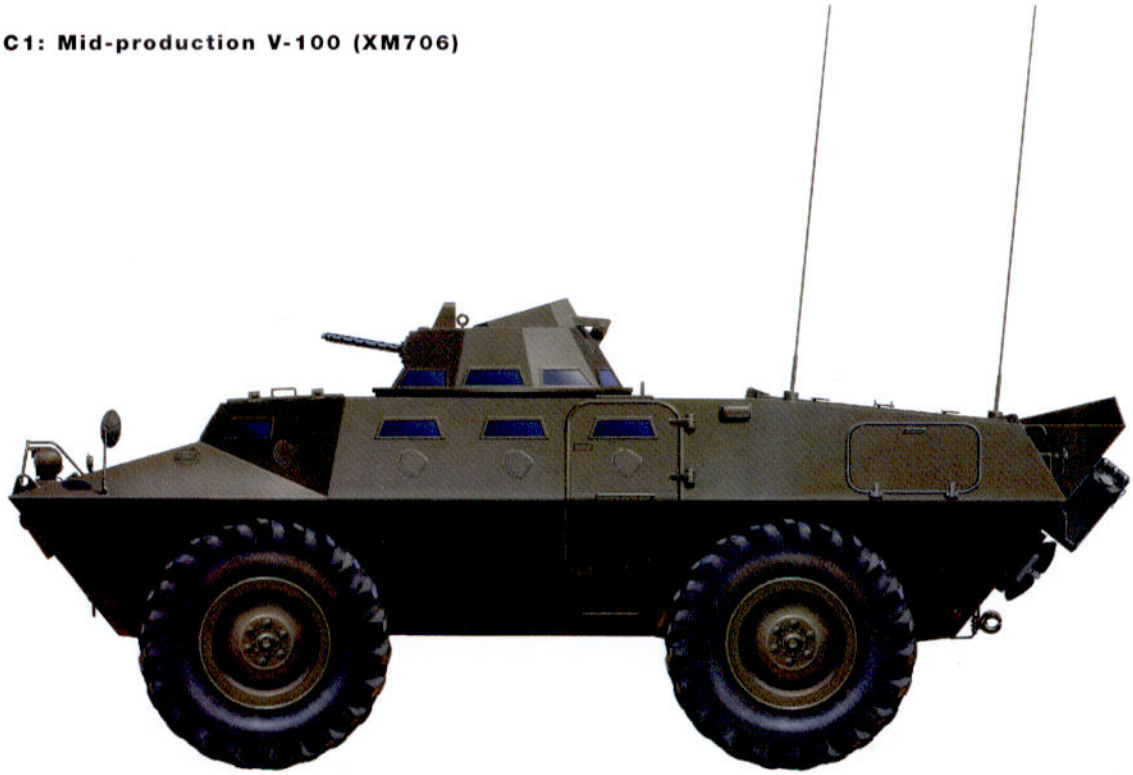
A1: Prototype pre-production V-100, c.1963

A2: Early-production V-100 (XM706), c.1966



B: Three-quarter view of a mid-production US Army V-100 (XM706E1)

C1: Mid-production V-100 (XM706)



C2: Mid-production V-100 with grenade launcher turret (XM706E1)

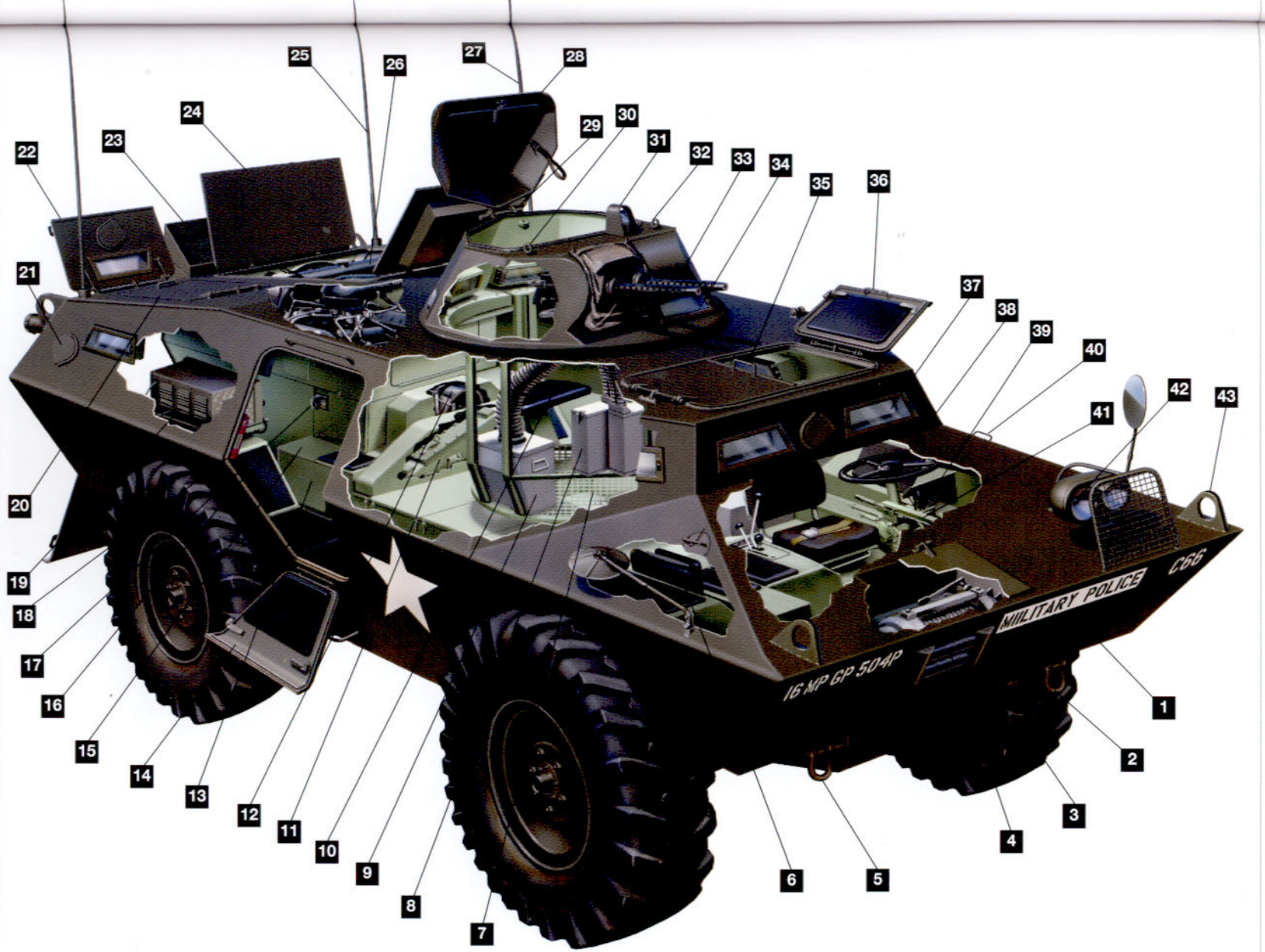
D: MID-PRODUCTION V-100 (XM706E1)

KEY

1 Front armor
2 10,000lb hydraulic winch
3 Commando Special 14 x 20 run flat tires
4 Transmission and Transfer shift levers
5 Towing shackle
6 Commander's seat (stowed)
7 Turret floor
8 Ready ammunition bins
9 Spent cartridge bin
10 Gunner's seat
11 Transfer case
12 Transmission
13 Engine compartment ventilation door
14 Side door (upper half removed for clarity)
15 Bench seats
16 Rear operator's seat
17 Slave receptacle
18 Fire extinguisher
19 Radio
20 Radio operators hatch
21 Gun port
22 Rear door
23 Engine exhaust tunnel
24 Engine hatch
25 Radio antenna
26 Engine
27 Radio antenna
28 Gunner's hatch
29 Air intake grille
30 Turret lifting eye
31 M29C gun sight
32 Gun mantle
33 M37 machine guns
34 Turret vision block
35 Commander's hatch
36 Driver's hatch
37 Vision block
38 Steering wheel and gear
39 Driver's instrument panel
40 Fuel tank
41 Emergency brake lever
42 Headlights
43 Lifting eye

SPECIFICATION

Radius of action, road
425–600 miles (680–965km)
Radius of action, cross country
250–425 miles (400–680km)
Fording Fully amphibious
Gradient climbing 50 degrees
Ground clearance
16 inches (41cm) under differential
24 inches (61cm) under hull
Ground pressure 15 psi (1.1 kg/sqcm) off road
21 psi (1.5 kg/sqcm) on road
Steering ratio 3-3/4 turns stop to stop
Combat weight 16,250lb (7378kg)
Motor
Chrysler 75M military waterproof 361 cubic inch (5.92 liters) V-8 191hp @4000rpm
Fuel 80 gallons (300 liters)
Power to weight ratio 23.5hp/ton
Overall length 224 inches (5.69m)
Width 89 inches (2.26m)
Height
M706E1 96 inches (2.45m) over turret
M706E2 85.8 inches (2.18m) over parapet
Maximum speed 61.5mph (99kph)
Wheel base 105 inches (2.26m)
Transmission
New process 540 5 forward 1 reverse
Transfer Single speed 1.33 ratio
Axles Rockwell M35 modified double reduction type fitted with licking differentials. 6.722/1 ratio
Tires 14 x 20 12 ply Commando Special "run flat"
Armament
M706 2-M37 .30-caliber machine guns
M706E1 2-M37 7.62mm machine guns
M706E2 provisions to mount up to 3 M60 7.62mm machine guns or M2 .50-caliber machine guns
Ammunition storage
Stowed
M760 8,750 rounds–caliber .30
M760E1 7,700 rounds–7.62mm
M760E2 5,940 rounds–7.62mm
Ready rounds
M760 1,000 rounds–caliber .30
M760E1 880 rounds–7.62mm
M760E2 none
Sight
M760 M29C
M760E1 M29C
M760E2 none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MILITARY POLICE
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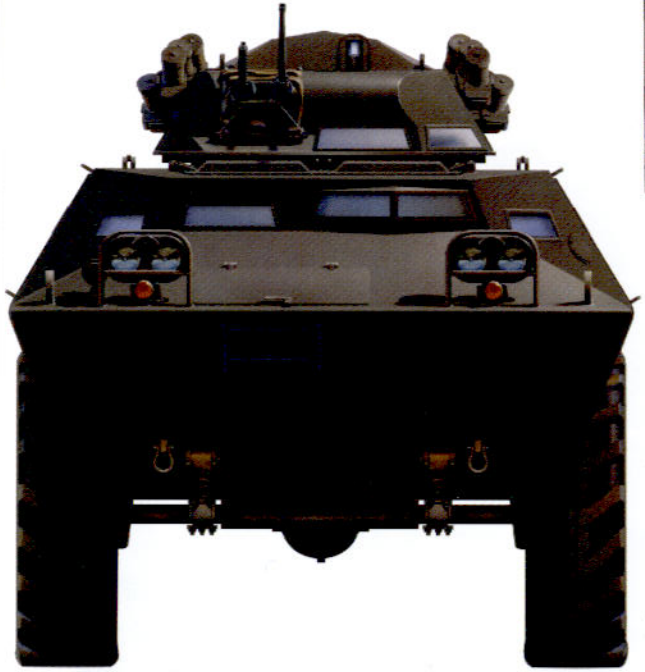
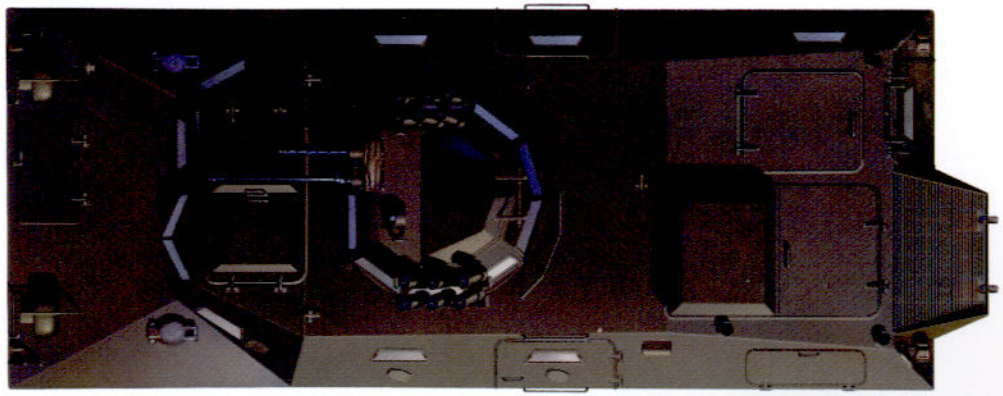
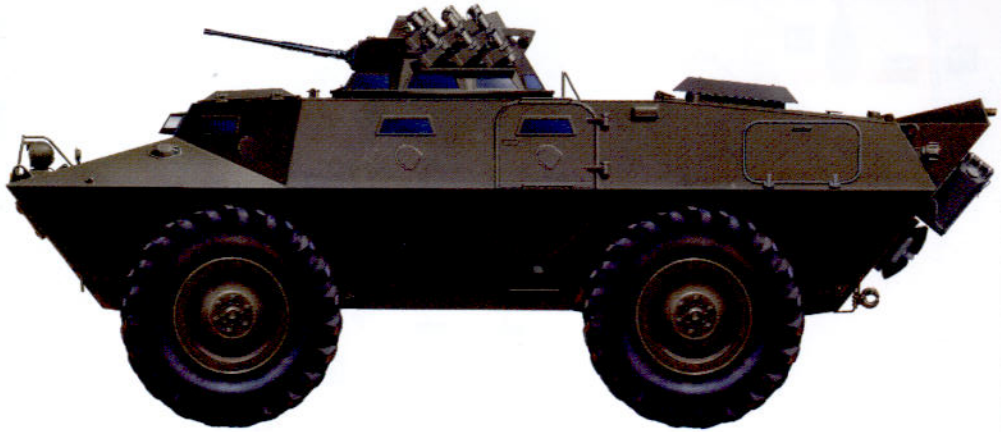
16 MP GP 504P

E: Late-production V-100, 1972

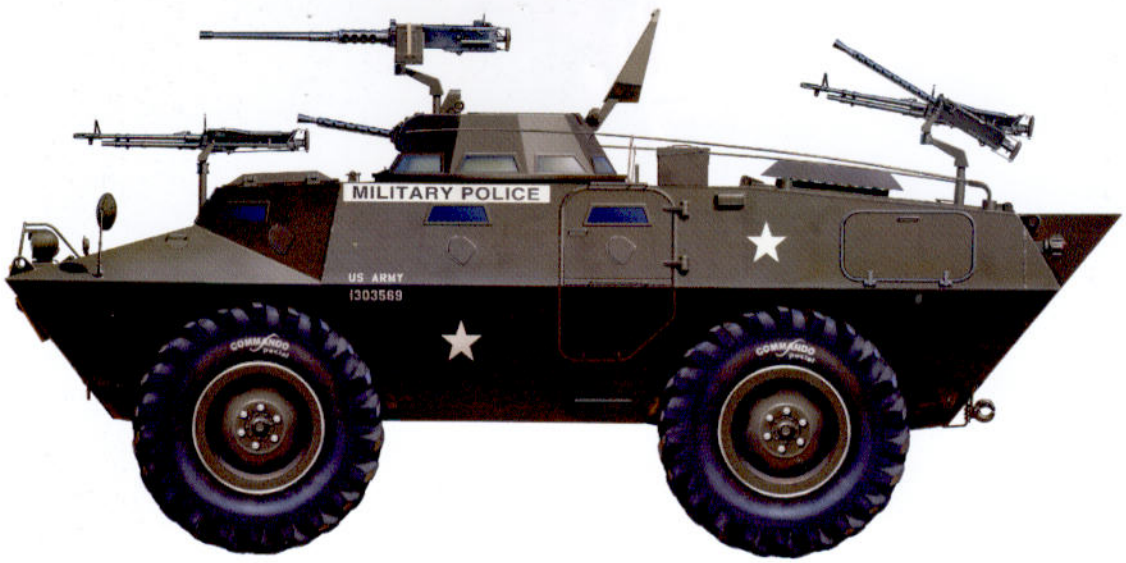






F: Three-quarter view of mid-production US Airforce V-100 (XM706E2)

G1: Field modified V-100 (M706)



G2: Late-production 81mm mortar V-100 (XM706E2)

An ARVN V-100 leads ARVN troops and 716th MPs in a counterattack against Bachelor Office Quarters #3 during the Tet Offensive. The truck to the left of the V-100 was ambushed by Viet Cong troops earlier. Note that the V-100 has its rear gun port open for ventilation and communication with supporting troops.

big", although there was little indication of exactly what or where. The answer came in January 1968 with the Tet Offensive. The Communist forces attacked across the country, causing the Allied forces to scramble to shore up defenses and push the attackers back. In Saigon, the attacks drew in support from the surrounding areas and with it came requests for more armor. The ARVN replied with M113s and XM706s, and the United States 720th MPs from Long Binh even sent two of their XM706s that they had just finished testing to 716th MPs. Reports later indicated that the V-100s were used on ammo re-supply missions, VIP rescues and direct support to ground troops.

Events of January 1968 further underlined the military police's need for V-100s. The 18th Military Police Brigade (namely the 716th MPs) quickly found themselves outgunned by the Viet Cong. V-100s and their crews sent to Saigon quickly proved their value and were used in areas where sniper and automatic-weapon fire was encountered. They were also employed to extricate friendly units pinned down under enemy fire. Since the V-100 was not able to stand up to heavier weapons fire (rockets and heavy machine guns), they were utilized primarily where there was only light-weapon fire.

One notable event occurred when two V-100s were dispatched to help a pair of pinned-down MP patrol jeeps. The jeeps were under fire from an enemy machine gun, which was located on the upper floor of a house. The V-100s arrived on the scene and approached the house. Using the twin .30-caliber machine guns, they fired on the VC machine gun's location, until they had advanced close enough for a crewmember to fire a grenade from his M79 into the house. The grenade silenced the machine gun and allowed troops to storm the building.

An unidentified US V-100 rolls through Ap Ninh Hung as part of a convoy. The antenna cable has been routed out of the radio operator's gun port to form a makeshift antenna mount on the rear of the vehicle.

In a complete reversal of their 1966 evaluation of the V-100, the 716th MP Battalion could not overemphasize the importance of the V-100 in an urban combat situation. The 716th now felt that the V-100 offered ideal shape, size, and maneuverability in builtup areas. Additionally, it offered the deterrent capacity of other armored vehicles without destroying the streets as tracked vehicles did. The only recommendation that the 716th MP Battalion made was for a heavier weapon, possibly either twin .50-caliber machine guns or twin 20mm cannons, which was yet another carryover from earlier USARV reports from the ARVN.

At a United States Army, Vietnam Convoy Security Seminar, the V-100 was presented to the attendees, generating interest in the vehicle as a replacement for tracked vehicles. The 4th Infantry Division, which was responsible for convoys in its area of operations, was concerned with the excessive mileage and increased maintenance on tracked vehicles. The 4th Infantry Division's concerns were sufficient for them to request the diversion of 30 new V-100s from ARVN to them. At about the same time, USARV recommended standardizing the V-100. In February, in light of the post Tet experience, and based on an evaluation of the duties and requirements of the brigade, a formal ENSURE request was submitted to the Department of the Army to purchase 72 V-100s under the designate of XM706E1.

Finally, in May 1968, the 4th Infantry request was granted and the 30 XM706s were loaned for a period of six months, which was extended several times until the 4th could receive their own vehicles. As with the six V-100s diverted for testing by ACTIV, the ARVN were supposed to support the XM706s with maintenance and spares, but this rarely occurred.

In April 1968, the USARV placed a hold on purchasing the V-100 due to labor problems at the Fruehauf site where the V-100 hull was

manufactured. The production schedule for the V-100 had been crippled, and Cadillac Gage had become a victim of its own success. With a maximum production rate of 25-30 cars per month, Cadillac Gage was having difficulties meeting the production schedule for the ARVN, US Air Force, and now possibly the US Army. Based on such production slippage, the Department of the Army wanted assurances that Cadillac Gage could meet the requirements they had for the V-100. The priority of delivery was to the ARVN troops first and then to the US Army Military Police. The USARV directed that the MPs designate a possible substitute vehicle for the V-100 to divisional MP units. The M114 reconnaissance vehicle was recommended as a substitute in case the Department of the Army did not approve Cadillac Gage's assurances for delivery.

In May 1968, the Department of the Army, after receiving assurances from Cadillac Gage, approved the ENSURE request for the 72 V-100s with a priority of issue to the 18th MP Brigade units. Deliveries of the new vehicles were to start in October 1968. An additional request under the ENSURE program for 94 more V-100s was filed, these vehicles were for issuance to the divisional units and the Free World Armed Forces (an umbrella term used for all non-US armed forces serving in Vietnam).

Crew members of "Iron Man"; a V-100 of the 66th MP Battalion. The nose of this vehicle sports the name and likeness of the comic book hero Iron Man. Covers have been added to the tops of the V-100s to help eliminate glare (a common complaint) from the headlights during night driving. The stretcher on the front nose of the V-100 is for removing wounded men from ambush scenes while under fire.

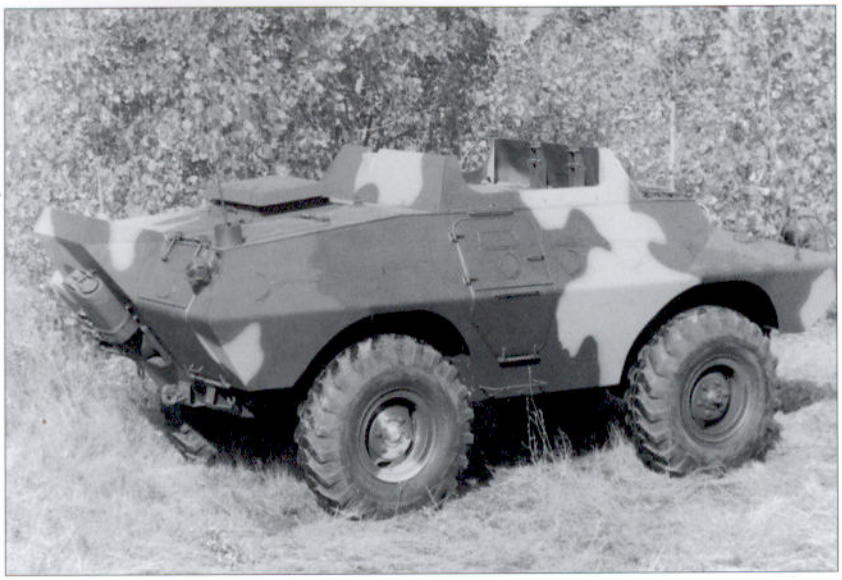
United States Air Force Security Police

The United States Air Force had also been studying the V-100 itself, paying close attention to the reports submitted by the ARVN, USARV, and ATAC. The reason for this interest was due to the number of sapper and infiltration attacks on USAF bases, such as Bien Hoa in 1966, and the Tet Offensive of February 1968 only increased the need for greater protection. The major change to the V-100 from the army's version was that of a weapons platform instead of a turret. The platform had bifold doors, which were surrounded by short-sloped Cadalloy armor walls with mounting points for M60s and an M2 machine gun. The USAF V-100 was not required to perform convoy escort duty but air base security, which consisted of patrolling the massive perimeters of air bases and long runways.

The first deliveries of the USAF's V-100, now designated the XM706E2, arrived in late 1968 in Vietnam, with deliveries to air bases in Thailand next and the Philippines sometime later. The XM706E2 were the only V-100s to have a camouflage pattern applied at the factory. Other interesting options that the XM706E2 had were a collapsible, plastic-coated canvas rainhood for

the driver's and observer's hatches. Another innovation was an A-frame that, when attached to the front of the vehicle and with the winch cable routed through the pulley of the A-frame, turned the vehicle into an armored recovery vehicle.

The USAF's V-100s were primarily used as Security Alert Team (SAT) vehicles. The SATs in their V-100s continually patrolled their assigned sectors of the base, avoiding following any patterns that the VC could track. In the event of hostile action, SATs were dispatched to the relevant area to provide cover fire for the six-member team to deploy from the vehicle, while maintaining radio contact with Central Security Control (CSC).

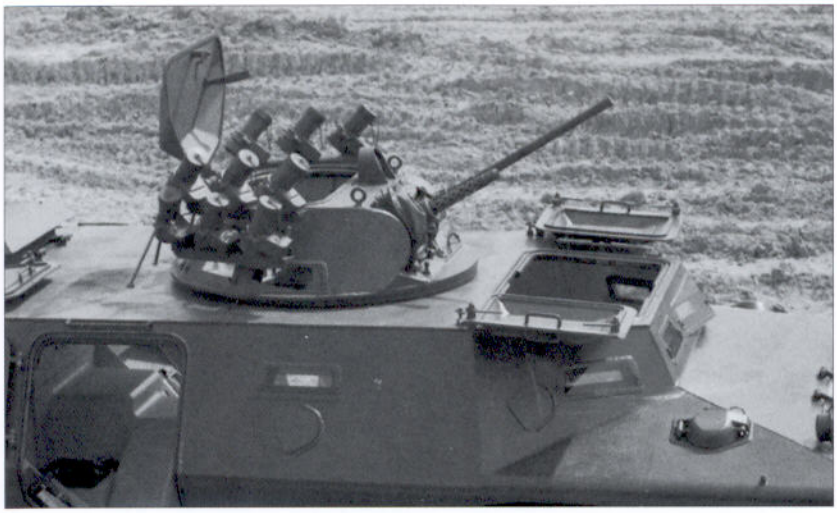


A freshly painted US Air Force V-100 illustrated against a woodland backdrop. USAF V-100s served as a mobile strongpoint and arms carrier for responding to intrusions and enemy attacks on air bases in Vietnam and Thailand. (Copyright Cadillac Gage Textron Inc.)

The tactic was to position the XM706E2 with the side of the vehicle toward the hostile threat, while allowing the team to dismount the vehicle from the opposite side and advance toward the hostiles. If the firefight continued for extended periods, the V-100s were used as ammo resupply vehicles and to evacuate the wounded from the area. On a few occasions, the USAF V-100s were used as convoy security, taking the role of lead vehicle. If the convoy had more than three cargo-carrying vehicles, an additional V-100 (if available) would be added to the convoy. The USAF V-100 preformed the same tactics as the US Army's in the event of ambush, with the XM706E2s responding by engaging the attackers and providing covering fire to evacuate the wounded. The USAF took the lessons learned by the army seriously; one such lesson was to leave at least one gunport open during a firefight to release pressure from concussions caused by explosions near the vehicle.

From 1968 onward, all three types of V-100s (XM706 for ARVN, XM706E1 for US MPs and the XM706E2 for USAF) were being delivered to Southeast Asia; however, obtaining spare parts was problematic. "Push Packs" of spares were being shipped to the wrong units or to units that had not received their V-100s yet. Spare parts packages were robbed of common military parts for use on other vehicles, leaving the V-100 short-changed. The lack of standard military Technical Manuals (TMs) compounded the problem. V-100s that had been damaged or which had suffered a breakdown were often cannibalized to provide parts for other V-100s in the unit. The situation overwhelmed the various maintenance battalions, and MPs frequently attempted to repair their V-100s themselves rather than deal with the maintenance personnel.

The lack of parts and specialized tools for the V-100 led to some interesting modifications. The MPs of the 101st Airborne Division designed and built a tire demounter for the Command Special tire. They went so far as to document it with pictures and drawings, and they even



View of a late-version V-100 mounting a .30 M37/.50 M2 machine gun combination. The detail of the wider vision block is seen here. The addition of the second vision block to the driver's position required the elimination of the front gun port. (Copyright Cadillac Gage Textron Inc.)

submitted the package to USARV to help other units. However, most modifications took the form of adding additional weapons to V-100s. The most common additions were welding a post on the right rear of the vehicle, near the radioman's hatch, and mounting an M60 machine gun. Servicemen would also weld a gun pintle from an M113 to the top of the turret and install an M2 .50-caliber machine gun. Even 7.62mm mini-guns, which had been robbed from helicopters, were added to increase the V-100's firepower. The 16th MP Group had a policy against such modifications; however, individual MP battalions and companies allowed the crews to carry extra weapons like the M60, which would be laid across the rear of the V-100 and used in the same manner as the ARVN V-100 crews used their M60s.

Many MP units also painted their vehicles to stand out from the sea of olive drab army vehicles. Everything from painting the lug nuts and lettering on the tires white, to nose art that covered the entire front of the vehicle was carried out. Most of the nose art was based on comic book characters, super heroes, movie titles, and rock band names. The more paint available to V-100 crews, the more colorful their vehicles.

By 1969, the demand for more XM706s was overwhelming. MPs, Thais, Korean, and US Army transportation units in Vietnam all clamored for V-100s, leaving those units with extra V-100s reluctant to give theirs up. Transportation units had been pushing the hardest for V-100s, as they had been using "hardened" gun trucks up to this point. These vehicles were standard 2 or 5 ton trucks modified with armored plates and with an array of weapons for convoy security. An ENSURE request for 80 more XM706s had been filed by transportation units, only to be rejected. The main reason for rejection was that although the MPs were consistently overextended, and not realistically able to provide such security, they were still officially responsible. Additionally, the US Army calculated that by the end of the year (1969) there would be a total of 683 V-100s in Vietnam, including both MP and ARVN models. Due to the production

A line of V-100s undergoing fording training in Lake Atmalan, Guatemala. The top-mounted air intake and exhaust, along with seals around the doors, made fording operations possible without any preparations.

schedule already in place at Cadillac Gage, delivery of the 80 additional vehicles could not take place until late 1970. The minimum of 30 days of transoceanic shipping to Vietnam compounded the problem. Only one transportation unit, the 63rd Transportation Company, is documented to have received V-100s for this role.

As the US forces were being withdrawn from Vietnam, the V-100s were turned in for repair and reissued to other units yet to receive their own V-100s. One example is as the 9th Infantry turned in their XM706E1s, they were reissued to the Thai Army Force in Vietnam, and the same was the case of the Korean force in the Republic of Vietnam. Even Laos received a few XM706E2s in 1970 from USAF bases in Thailand.

V-100 crews undergoing amphibious training in Lake Atmalan, Guatemala.

ARVN forces continued receiving new V-100s until May 1970, with serial number 10921 being the last one. Most of these units were issued to replace those destroyed while on loan to US forces. Production records indicate 477 V-100s were sold to South Vietnam, but with the confusion of loans and replacement of combat-loss vehicles, the total number is uncertain. Case in point, serial number 10921, somehow made its way back to the USA and was last seen at Crane Naval Depot in Indiana during the early 1990s.

The last USAF model was received in November 1970, while the last US Army model was received in July 1970. By 1972, most of the V-100s had been returned to the USA as the troop withdrawals continued. Surprisingly, nearly all the V-100s were returned, including the battle- damaged and cannibalized units. The XM706 served the ARVN forces until the bitter end and the final fall of Saigon in April 1975.

TACTICS

As the US Military Police gained experience with the V-100, the tactics and techniques of its deployment evolved. Convoy escort soon became a key duty for the V-100 in Vietnam. The primary tactic of the North Vietnamese Army (NVA) and Viet Cong (VC) units who were attacking the convoys typically began with immobilizing a truck (or trucks) within the ambush zone. The convoy would then come to a halt within the area of the ambush (known as the "kill zone") and the VC would systematically destroy them at will. The NVA/VC troops would usually let the leading portion of the convoy, along with the MPs escorting them, pass and then attacked the middle or the rear of the convoy.

An ambush would typically last for 15–30 minutes, and was usually conducted in an area of heavy vegetation in order to provide cover from which to both attack and withdraw. The NVA/VC placed a heavy reliance on the B40 rocket, which was designed to destroy cargo vehicles, and mortars during these attacks,.

Another favored tactic of the NVA/VC troops was the use of mines, which were usually emplaced at night and were left for the convoy to trip as it went along. The 504th Military Police Battalion used its V-100s as patrol vehicles to open the roads each day by preceding the convoys and examining the road for land mines, as well as checking the route for enemy activity.

A typical convoy was made up of between 10 and 300 vehicles. Convoys would comprise cargo vehicles, transportation security vehicles (consisting of gun trucks and gun jeeps), military police security vehicles (consisting of V-100s and more gun jeeps), and additional firepower from units consisting of M48 tanks, M113 armored personnel carriers, carrying infantry squads, and M42 Dusters with 40mm guns. The armored units were attached to the convoy by the regional commander to provide additional support, and they were also used as quick reaction teams to combat ambushes.

Convoy routes were classified with color codes, red, yellow or green, depending on the level of enemy activity on the route, red being the most likely to be attacked.

When the military police first started to use the V-100 in escort duty they typically placed a V-100 at the front and rear of the convoy. If additional V-100s were available, they would be placed throughout the length of the convoy for additional protection. Transportation gun jeeps and gun trucks along with any attached security elements would be

While escorting a convoy, this 504th MP V-100, one of the three evaluation units, detonated a contact land mine, resulting in the front tires being blown off.

Rear view of the 504th MP V-100. Note that the crew has painted an artwork on the top of the gunner's hatch. This was a common practice among crews of armored vehicles.

further spread throughout the convoy. It was quickly realized, however, that on the narrow roads of Vietnam it was time consuming to turn around a V-100 and return to the "kill zone". The military police then shifted the location of the V-100 to the middle and the rear of the convoys so that they could react to an ambush quicker.

A convoy would typically start at 5am, with the military police meeting the transportation units and forming the convoy up. Vehicles would be separated into serials with a gap of approximately five minutes *between* each one. A serial consisted of a gun jeep, four to six cargo trucks, and a gun truck or a V-100. Vehicles were sorted according to cargo and placed within the convoy order appropriately. Usually food and essential items would be first, followed by general cargos, and last would be oil and fuel tankers. There would be a briefing of the latest intelligence and important information, such as friendly assets available for support and which radio frequencies were to be used. The convoy would then depart for its destination, with each truck driver instructed to keep 100 yds between himself and the preceding truck.

Once an ambush occurred the MPs would spring into action. The V-100 would enter the kill zone and provide suppressive machine gun fire while the trucks attempted to exit the kill zone. Additional MPs would prevent trucks from entering the ambush zone. While the gunner of the V-100 provided suppressive fire, the other crew members exited the vehicle and collected any wounded soldiers (this is why stretchers were often seen lying across the front of V-100s). The scene was repeated many times during an ambush. A V-100 would pull up next to a pinned-down truck driver, and a member of the V-100 crew would jump out and assist the driver to enter the armored vehicle. The V-100 would then drive out of the ambush zone and discharge the driver and any others in the vehicle with him, before returning to the kill zone to pick up more drivers until they had all been collected. Alternatively, the ambush might end with the arrival of security reaction teams to pursue the attackers or the attackers might fade away into the jungle.

The mission of the MPs was not to attack and eliminate the NVA/VC force, but to protect the convoy and make sure that it reached its destination. It was the responsibility of the commander for the forces in the area that the convoy was operating in, to provide the forces necessary to pursue and destroy any attacking NVA/VC.

Miss Jackie and Bertha of the 148th MP Platoon parked in their compound. The 148th MPs performed convoy security duties with their ARVN counterparts the QC.

The use of the V-100 by the military police was part of a bigger plan to provide security for the convoys and their valuable cargo. The US Army tried to implement several approaches to dealing with the ambush problem. Where ambush activity was especially high, the Engineers were called in to clear the sides of the road of any vegetation, and if necessary move small hamlets up to 1,000 yds back from the road. Helicopter gunships and air support units, as well as artillery units, were placed at the convoy commander's disposal for use against ambushing forces. Many roads were paved to try to prevent the NVA/VC planting mines, however, the enemy simply tunneled under the roads to scupper this tactic. Despite all the attempts at dealing with the ambush problem, ambushes remained a major issue for US Army units until the end of the US involvement in Vietnam.

One of the other uses of the V-100 by the military police was to prevent loss of government property to thieves and black marketeers; this was the mission of Operation Night Overtake. The military police would escort convoys nightly between Newport Bridge, located outside of Saigon, and the Long Binh Post. The Newport Bridge was the entrance to the Newport docks area, where the majority of supplies from America entered Vietnam. The reason for Operation Night Overtake, was that a large portion of supplies was not making it to Long Binh. Usually a truck would drive onto one of the many side streets and quickly be emptied of its cargo.

The military police mission was to escort the convoys and ensure that none of the trucks left the convoy. Two gun jeeps would patrol on either side of the convoy, while another led the convoy and a V-100 followed. This was the only routine night convoy operation in Vietnam; the majority of convoys occurred during the day.

When the V-100s were not used as convoy escorts, their other functions were to patrol roads during the day and to act as a static defense point or as part of a reaction force for base defense at night. However, the primary mission of the military police and the V-100 was that of convoy escort.

BEYOND VIETNAM

The V-100's service with US military did not cease with the withdrawal from Vietnam. The US's XM706 continued to serve until the mid-1980s

as security vehicles for nuclear sites, both Department of Defense and Department of Energy facilities. But, despite their relatively low mileage, these vehicles were deemed obsolete, and they were slowly replaced by Cadillac Gage's Peacekeeper armored cars. Some V-100s were scrapped outright to be used as hard targets on bombing ranges. Only a handful survived as displays in museums, while some were purchased by law enforcement agencies as SWAT vehicles. Fewer still became pampered collectibles owned by military vehicle enthusiasts.

A late-production V-100 Emergency Response Vehicle with a raised center section. The elongated slots in the raised section allowed better elevation for the firing of tear gas guns into riots and crowds. (Copyright Cadillac Gage Textron Inc.)

Other countries purchased the V-100s during the Vietnam War. Lebanon purchased nine V-100s between 1969 and 1971. These V-100s were based on the late-production ARVN models with the .30/.50 machine gun combination turret. The last documented use of the Lebanese V-100s was in 1988.

Bolivia was the next country to purchase V-100s, taking delivery of seven Commandos in January 1971. These vehicles also had the .30/.50 turret, like that of the late ARVN and Lebanese models. Guatemala, a few months later, purchased theirs and received training from US Army and Cadillac Gage personnel. For these countries the V-100 was the answer to stem the rise in anti-government rebels in the region. The Guatemalan V-100s were the first to have the improved versions of the Commando. The improvements included double vision blocks for the driver, ballistic fuel cap covers instead of the original flat covers, spring-loaded folding troop seats, and the wire mesh removed from in front of the headlight assemblies.

Venezuela purchased 77 V-100s between 1971 and 1973, and like other Cadillac Gage customers the bulk of its purchase was for the standard model with the twin machine gun turret. However, Venezuela broke with tradition and also ordered Command and 81mm mortar versions as well.

The Venezuelan V-100s remained in service until the late 1980s when finally most of the fleet was deadlined because of a lack of maintenance and spare parts. The V-100s were parked with other military vehicles and slowly cannibalized for parts to keep other vehicles alive.

The last major purchaser of V-100s was Malaysia from 1971 to 1972. Malaysian V-100s were a mixture of turret models, with either the twin 7.62mm machine guns or the 7.62/.50 combination. Malaysian vehicles all had Wegmann grenade launchers attached to the sides of the turrets. The Wegmann launchers were 66mm and consisted of two banks of launcher tubes. The upper bank of launcher tubes was for

This late V-100 is shown at Rock Island Depot, and is fitted with a 40mm turret. The 40mm turret, which was a modified air cavalry turret, was developed in response to requests by MPs for more firepower for their vehicles. (Copyright Cadillac Gage Textron Inc.)

fragmentation grenades, while the lower bank held smoke or tear gas grenades.

The evolution of the Commando from the early days onward indicated the need for a better and stronger suspension system than that offered on the V-100. Though some changes were made to the V-100's design, the truth was that a major design change to the hull was needed to fit 5 ton axles to correct the problem. Cadillac Gage in 1967/68 developed the V-200[7] for Singapore. The V-200 sported 5 ton axles and a commercial Chrysler 440 V8 gasoline engine. Singapore military required an array of variants, including 90mm and 20mm two-man turrets, 81mm mortar carriers, and recovery models. Production of the V-200 began in 1969 and was completed a year later.

By combining the designs of the V-100 and V-200, engineers of Cadillac Gage developed the V-150. It had the looks and handling of the V-100 and the strong 5 ton axle suspension of the V-200. The V-150 provided the platform needed for larger weapon stations other than a small, twin machine gun turret.

By 1997 the V-150 had evolved into the XM1117 and was finally standardized as the M1117 Guardian, and in a strange twist of fate the first US Army Military Police to receive the M1117s was the 720th MP Battalion at Fort Hood, Texas. Almost 30 years to the day that they received the XM706, the 720th MPs again found themselves evaluating a Cadillac Gage armored car for MP use. Incredible as it seems, the M1117 mission requirements mirrored that of the V-100. The Guardian's turret mounted a Mk19 40mm and M2 .50-caliber machine gun, exactly what had been asked for by the ARVN and US advisors 30 years before.

7. Not to be confused with the V-200 Chaimite vehicles produced by Portugal. The Chaimite vehicle was a copy of the V-100, which Cadillac Gage later re-powered and modernized in the mid-1980s.

Lines of V-100s on parade in Malaysia in the early 1970s. Most of the vehicles pictured here are armed with the twin machine gun turret. (Copyright Cadillac Gage Textron Inc.)

COLOR PLATE COMMENTARY

A1: PROTOTYPE PRE-PRODUCTION V-100, C.1963

This preproduction sales model uses the M113 periscopes, nondirectional tires and an early prototype turret. The vehicle illustrated was used as a demonstrator and was tested by the US Army in 1963 at Aberdeen Proving Grounds. The turret is fitted with twin, manually operated M37 or M1919A4 machine guns.

The vehicle has been painted with the standard US Army semigloss olive drab green, and it has advertising on its rear quarter.

A2: EARLY-PRODUCTION V-100 (XM706), C.1966

Vietnamese V-100s were armed with twin .30-caliber M37 machine guns, though crews would often supplement the turret guns with a .30 machine gun with a bipod mount laid across the engine deck; this weapon would be fired from the radio operator's hatch.

This Vietnamese V-100 (XM706) shows typical features of early-production Commandos and was probably delivered to Vietnam in early 1966. The features of the vehicle indicate that it lies between serial numbers 10029 and 10075. Early V-100s had the pioneer kit mounted on the left rear of the vehicle and lacked the engine side-access hatch. Additionally, the vehicle is fitted with the squared cut wheel-well openings and the standard military nondirectional 14.00 x 20 tires. Flat driver's and commander's hatches, the lack of the shield over the air intake, as well as the missing fording shroud at the top of the exhaust tunnel, further indicate the age of this vehicle.

B: THREE-QUARTER VIEW OF A MID-PRODUCTION US ARMY V-100 (XM706E1)

A V-100 of the 560th Military Police of the 93rd Military Police Battalion, 16th MP Group on convoy escort in northern Vietnam. This vehicle clearly illustrates the US Army markings found on the XM706E1. The lower front plate of the vehicle would typically carry the Group Organization on the right-hand side, with the battalion designation directly below it. The company designation was displayed on the left-hand side, and below that the individual vehicle identification. Some units were known to place the unit markings on the upper front plate.

The vehicle illustrated is unique in that it has the bridge marker plate on the front. Bridge marker plates were used, along with bridge weight designations, so that a driver would know if a bridge could carry the weight of the vehicle.

The side of the vehicle carries a military police designation on the side, as well as prominent national markings (white stars) on the lower front and engine access hatch. Additionally, the side of the vehicle carries the US Army and assigned registration number of the vehicle. The registration number was marked on the lower front portion of the hull and the US Army line appears above the waistline of the hull. Tire pressure information is painted directly above the hull.

ABOVE **Lebanese protesters in Beirut flee from an advancing Lebanese Army V-100 in 1970. V-100s remained in service in Lebanon until the late 1980s. (Copyright Cadillac Gage Textron Inc.)**

BELOW **Final version of the V-100 pictured at the factory in the early 1970s. Lessons learned from Vietnam have been incorporated into the final version, which incorporates twin M60 machine guns. The final model also offered Wegmann grenade launchers, a spotlight, twin vision blocks for additional visibility for the driver, and a towing cable stored on the nose of the vehicle. The revised headlight guards, which were intended to cut down on glare, and the revised covers for the fuel tanks are also all visible on this model. (Copyright Cadillac Gage Textron Inc.)**

The cartoon of the Roadrunner character on the lower side front of the vehicle is a reference to the nickname given to the MPs who provided convoy security in Vietnam. With its large flat surfaces the V-100 provided an excellent canvas for military policemen to express themselves. Artworks based on references from popular culture were widely displayed, with the likes of Snoopy, Iron Man, The Good, The Bad and the Ugly, Odin, and Captain America all adorning these armored fighting vehicles.

C1: MID-PRODUCTION V-100 (XM706)

The ARVN (Vietnamese) V-100 pictured here, along with others from the US Army 720th MP Battalion and the ARVN units, was used to counter the Tet Offensive in Saigon during January and February 1968. These vehicles were the only armor available to counter the VC attack and were instrumental in clearing snipers and machine gun nests located in buildings in Saigon.

This particular vehicle is clean and free from modifications to the hull, but it does have typical damage to the front headlight guard and its lifting eye, probably caused by pushing objects.

The vehicle shows the features of the mid-production V-100s. The square-cut wheel-well openings have been replaced with a curved profile to eliminate cracking at the corners of the openings. Wire mesh has been added to the headlight guards for added protection. The standard military 14.00 x 20 tires have now been replaced with the Commando Special "run flat" tires. The flat driver's and commander's hatches are still retained in the mid-production vehicles, though by this stage the fording shroud had been added over the top of the exhaust tunnel.

C2: MID-PRODUCTION V-100 WITH GRENADE LAUNCHER TURRET (XM706E1)

In response to requests from MPs for more firepower for their V-100s, Rock Island Arsenal developed a turret mounting a 40mm XM132 grenade launcher machine gun. The turret replaced the standard, twin machine gun turret and was a modified armored cavalry turret, similar to the ones fitted to the M113 armored personnel carrier. The turrets were developed late in the Vietnam War and, although they were field tested, they were not adopted.

The turrets and vehicle have been painted the standard semigloss olive drab with white markings.

D: MID-PRODUCTION V-100 (XM706E1)

This V-100 is the twin 7.62 M73 machine gun-armed model, which was delivered to US military police units starting in 1969. Eventually 166 of these vehicles were delivered and used throughout Vietnam.

E: LATE-PRODUCTION V-100, 1972

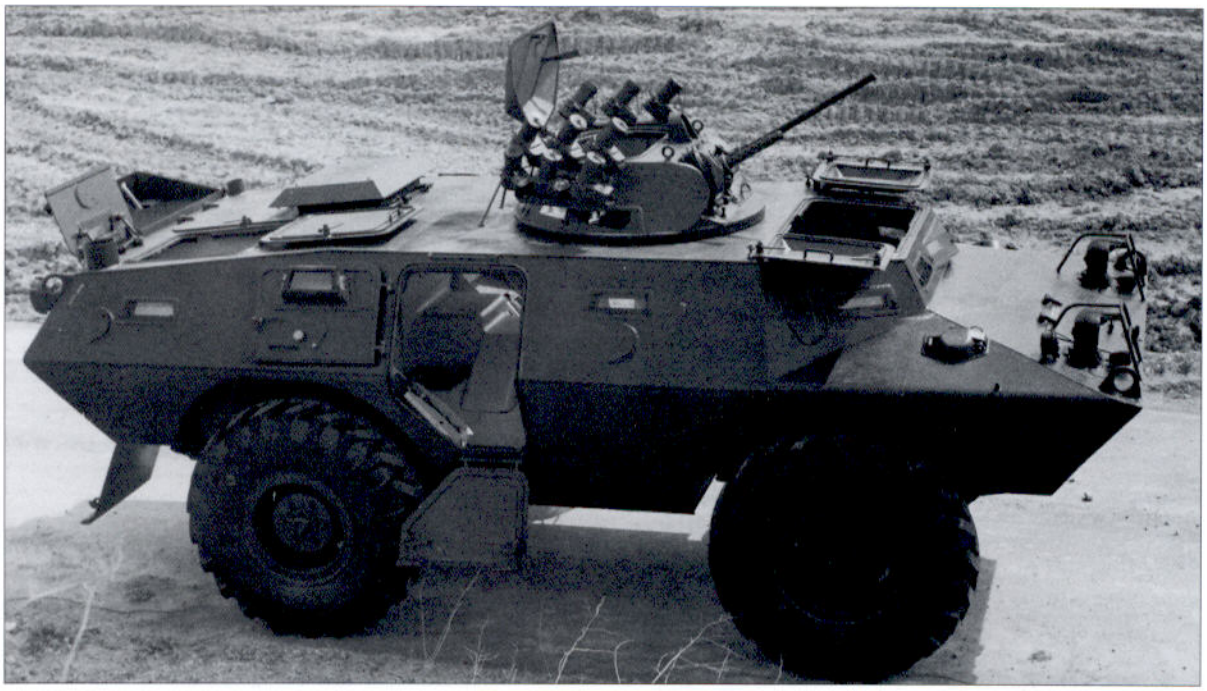
This vehicle, which was bound for Malaysia, sports all the improvements learned from Vietnam. Angled vision blocks have replaced the single vision block for improved driver visibility. The flat fuel-covers have given way to the US military standard covers for better ballistic protection. To reduce glare, the wire mesh in front of the headlights has been removed and the front of the guard reinforced with an additional cross piece. The gunner can now fire either fragmentation or smoke grenades, courtesy of the 76mm Wegmann grenade launchers that have been attached to the turret. The exhaust pipe now exits outside of the fording shroud around the exhaust grille, allowing the exhaust fumes to vent away from the vehicle.

F: THREE-QUARTER VIEW OF MID-PRODUCTION US AIRFORCE V-100 (XM706E2)

In 1968, responding to threats against US air bases in Vietnam and Thailand during the Vietnam War, the US Air Force purchased the V-100 for use by its security police forces.

The security police typically used this version of the V-100, which was assigned the designation XM706E2, as a mobile strongpoint and heavy weapons carrier. The XM706E2 differed from the US Army and ARVN models in that it used the parapet instead of the manually operated turret. The parapet contained a pair of bifolding doors that, when opened, allowed all-around firing and provided additional protection for the gunner. Five sockets for pintle-mounted machine guns, two in the front, one on either side, and one on the rear, provided the ability to mount the guns wherever necessary. The side-mounted pintles could be folded down when not needed.

Later model V-100s and crews undergo fording training and familiarization on Lake Atmalan in Guatemala. This V-100 has just entered the water.



Another view of a late-version V-100; this time mounting a .30 M37/.50 M2 machine gun combination. The detail of the wider vision block can be seen here. The addition of the second vision block to the driver's position required the elimination of the front gun port. Revised headlight guards, ballistic fuel covers, grenade launchers and the extended exhaust pipes, are all visible. (Copyright Cadillac Gage Textron Inc.)

Typical armament for the XM706E2 was a .50 M2 machine gun in one of the front pintles, and a second weapon, usually a 7.62 M60 machine gun, mounted in either one of the rear or side pintles.

The vehicle pictured here is a later, mid-production V-100 and shows several changes over the earlier vehicles. While still retaining the 12 vision blocks of early models, the later versions incorporated the new raised profile on the commander's and driver's hatches. The change was to provide more headroom for the driver and commander. A Molotov cocktail shield was added over the air intake to prevent flaming liquids getting into the engine compartment.

US Air Force XM706E2s were painted in a three-color camouflage pattern consisting of 50 percent Flat Olive Drab, 25 percent Flat Sand, and 25 percent Flat Forest Green.

G1: FIELD MODIFIED V-100 (M706)

This heavily modified military police M706 is bristling with machine guns and appears ready for anything. Often, when a convoy was ambushed, the military police M706s, gun jeeps, and the transportation unit gun trucks were the only forces available to stem the attack for the first few critical minutes.

In order to bring maximum firepower to bear on attacking forces, and with the ongoing problems with the turret-mounted twin M73 machine guns, military policemen quickly took to adding to their vehicle's basic armament. The MPs felt that the 7.62 rounds fired from the M73 machine guns did not penetrate the dense jungle foliage found along some of the convoy routes. The M2 .50-caliber machine gun was the favored weapon for this role, or if available a scrounged 7.62 GE mini-gun. However, both these weapons had a healthy appetite for ammunition, which required strapping extra ammunition cans to the top of the vehicle. In addition to the exterior weapons, the crew's individual weapons, consisting of the M16 rifle, the .45 M1911A1 pistol and the vehicle commander's M79 grenade launcher, completed the available weapons to repulse an attack.

G2: LATE-PRODUCTION 81MM MORTAR V-100 (XM706E2)

In order to provide support for troops, Cadillac Gage developed an 81mm mortar carrier with a 360 degree mount. Utilizing the same parapet as the USAF XM706E2, the V-100 incorporated a mounting base for the mortar in place of the troop seats. The parapet contained a pair of bi-folding doors that, when opened, allowed the mortar to be elevated and fired. The five sockets for pintle-mounted machine guns remained, two in the front, one on either side, and one on the rear, providing the ability to mount machine guns wherever necessary. The side-mounted pintles could be folded down when not needed. A mortar base replaced the rear pioneer tool-rack, the spare gas can and carrier.

The vehicle pictured here is a later-production V-100 and incorporates all the changes based on earlier experience. The only sale of the 81mm V-100 mortar-carrier version was to Venezuela, which received 12 of this type.

Mortar-carrier V-100s were painted in a three-color camouflage pattern, consisting of 50 percent Flat Olive Drab, 25 percent Flat Sand, and 25 percent Flat Forest Green.

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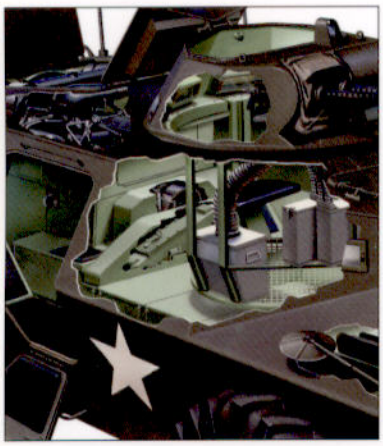

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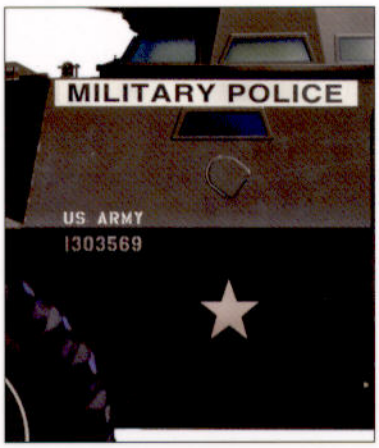

Unrivaled detail

Destined to become one of the most influential post-war armored cars, the V-100 Commando was developed by the Cadillac Gage Company in 1962 as a private venture, and the first prototype was completed in the same year. It was designed as a multi-purpose vehicle and could function as an 11-man personnel carrier, reconnaissance vehicle, convoy escort, command or patrol car and a riot vehicle. The V-100 was tested and evaluated in Vietnam before full-scale production began in 1964. It saw widespread use in Vietnam by both US and South Vietnamese forces. This title describes the design, development and operational use of the V-100 Commando, including its continued deployment around the world today.

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